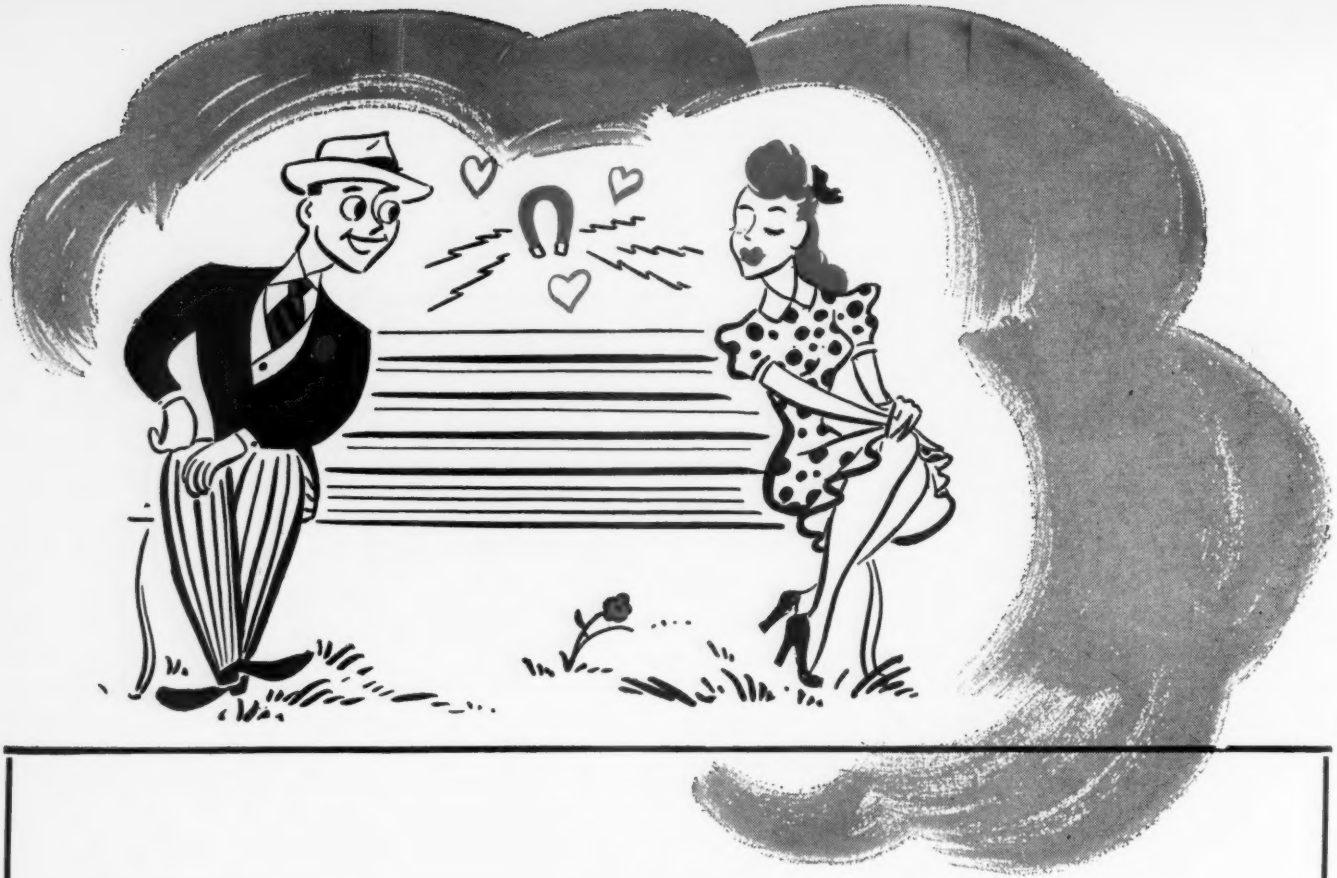
CERAMIC ABSTRACTS and THE BULLETIN

OF THE

AMERICAN CERAMIC SOCIETY

SEPTEMBER 15, 1945

MONTHLY PUBLICATION DEVOTED TO THE ARTS AND SCIENCES RELATED TO THE SILICATE INDUSTRIES



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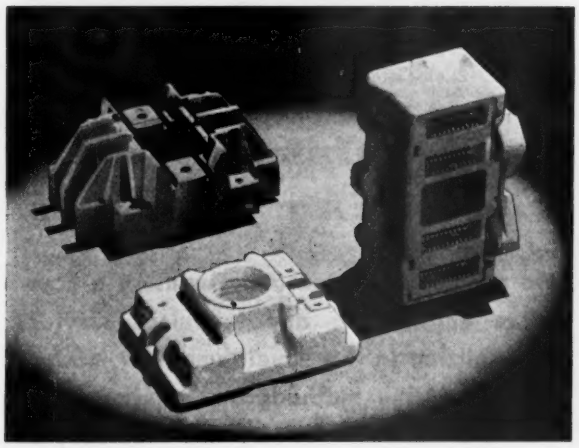

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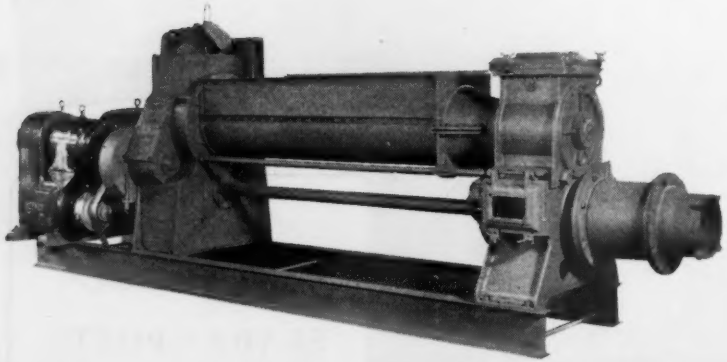

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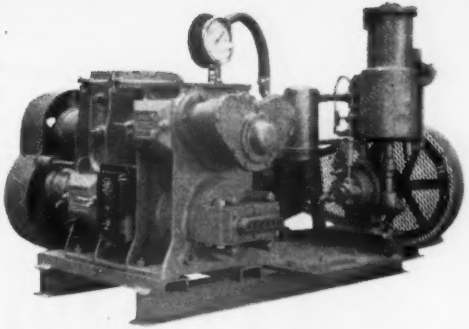

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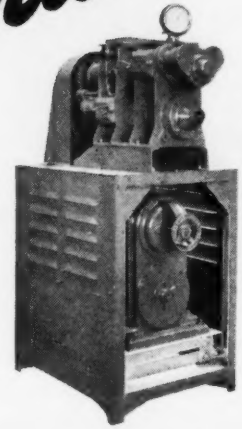

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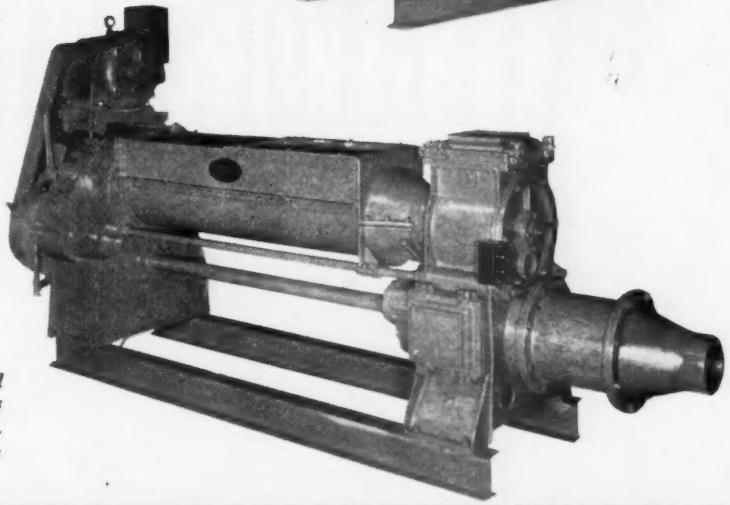

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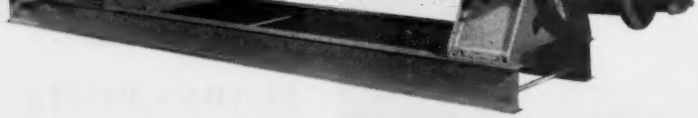

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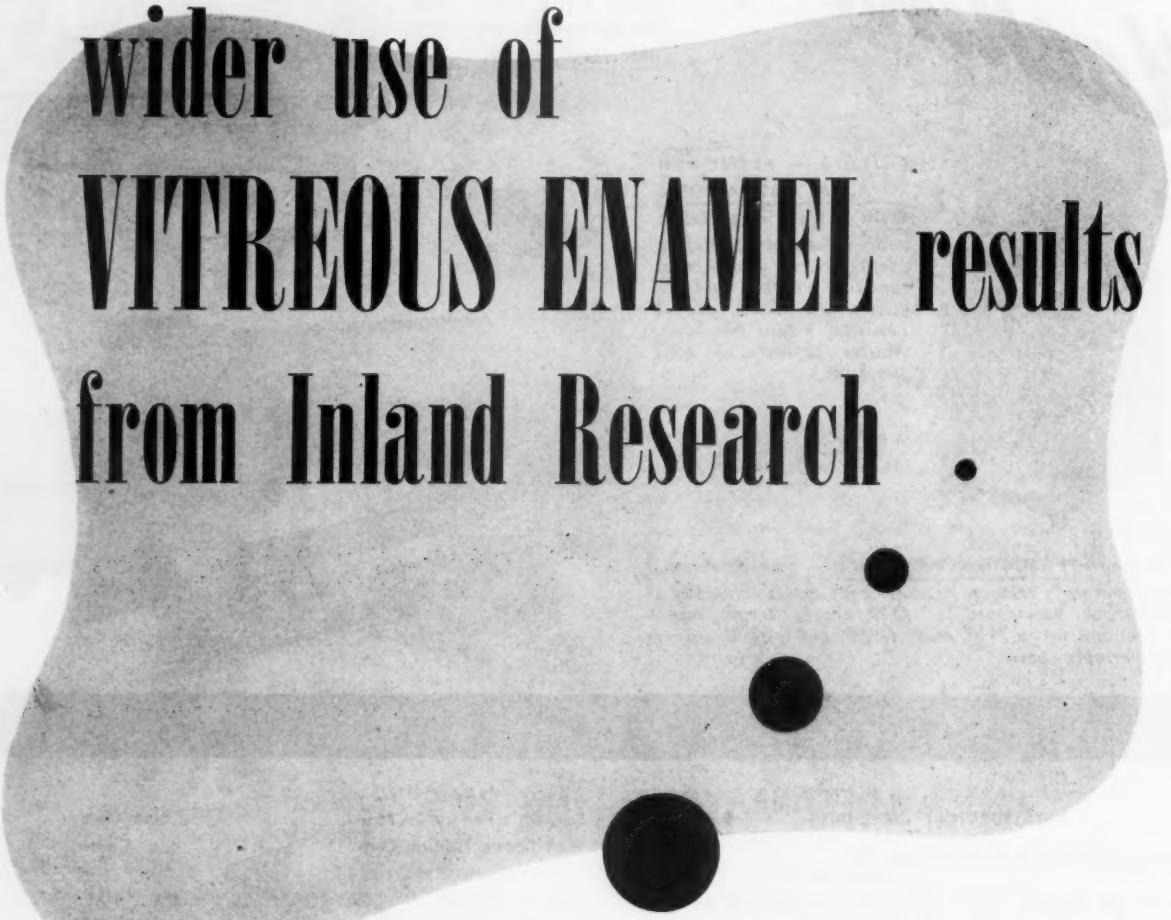

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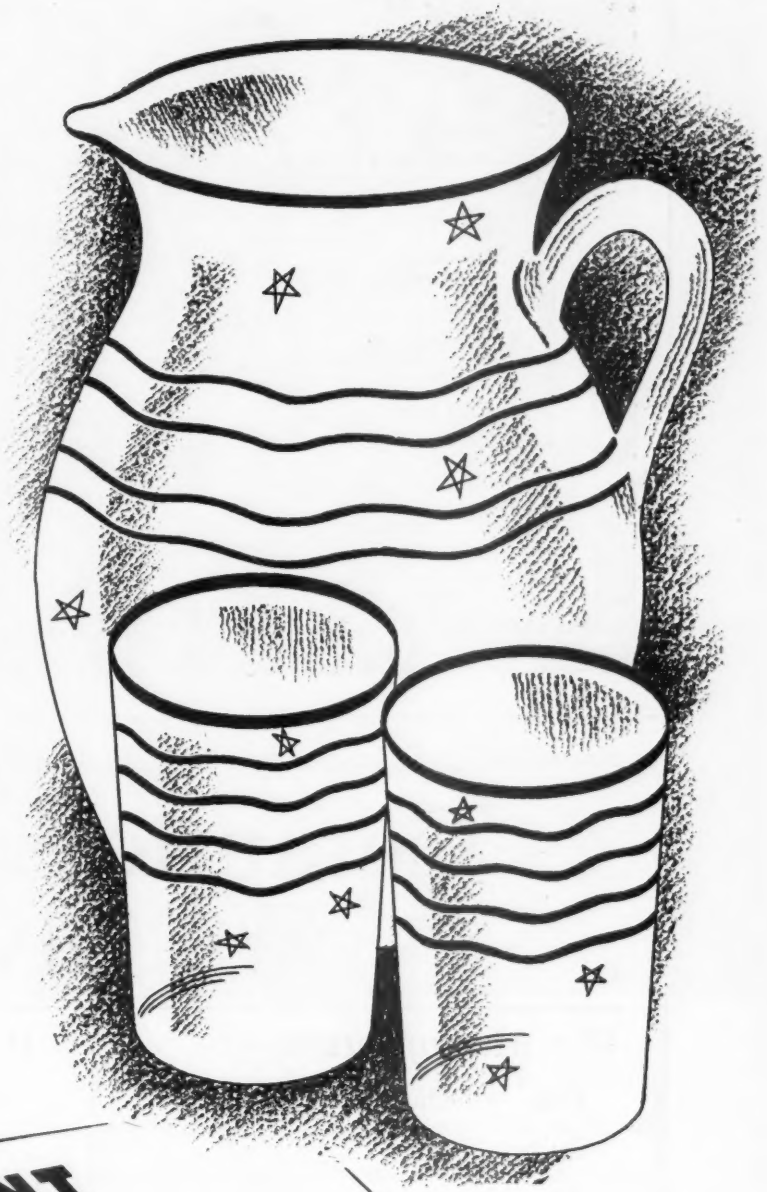

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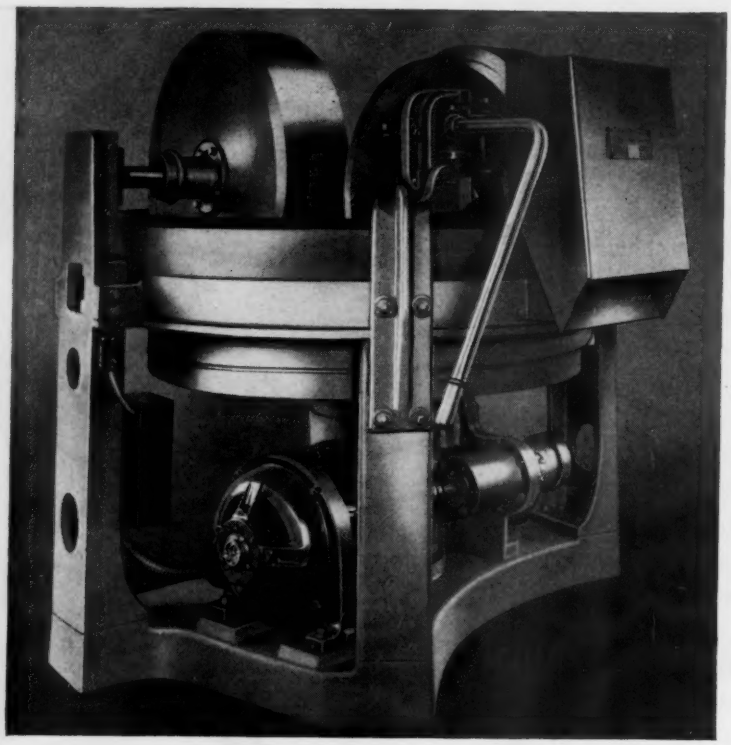
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



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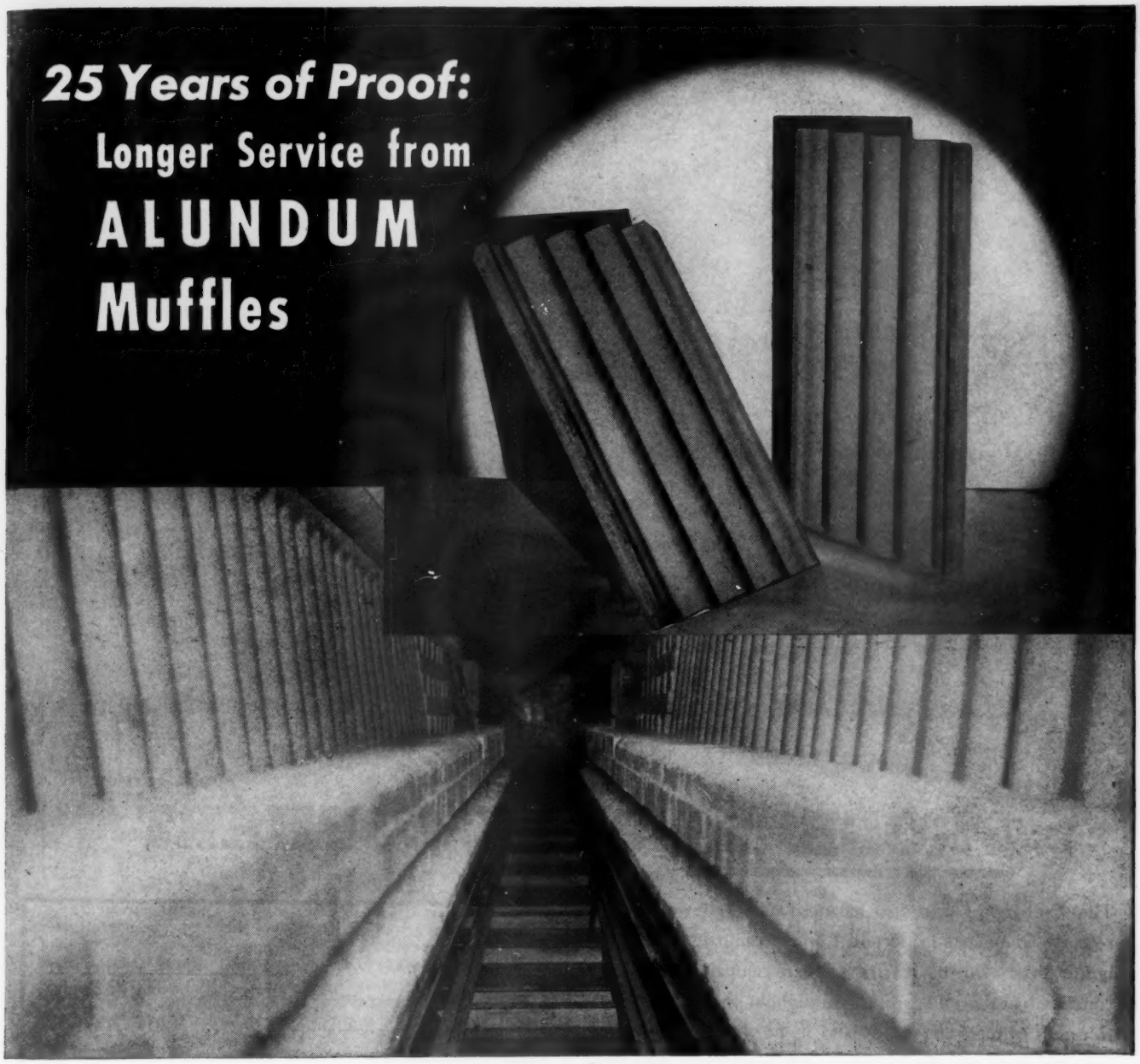

FOR more than a quarter of a century Norton Alundum muffles have been proving their worth by continuously providing long, trouble-free service. Made of electrically fused alumina plus a highly refractory bond, alundum muffles possess great refractoriness, chemical stability, physical strength, and excellent heat transfer properties. Their strength permits thin cross section for rapid passage of heat, and patented corrugated design allows further reduction in thickness and greatly increases the radiating surface of the muffles.

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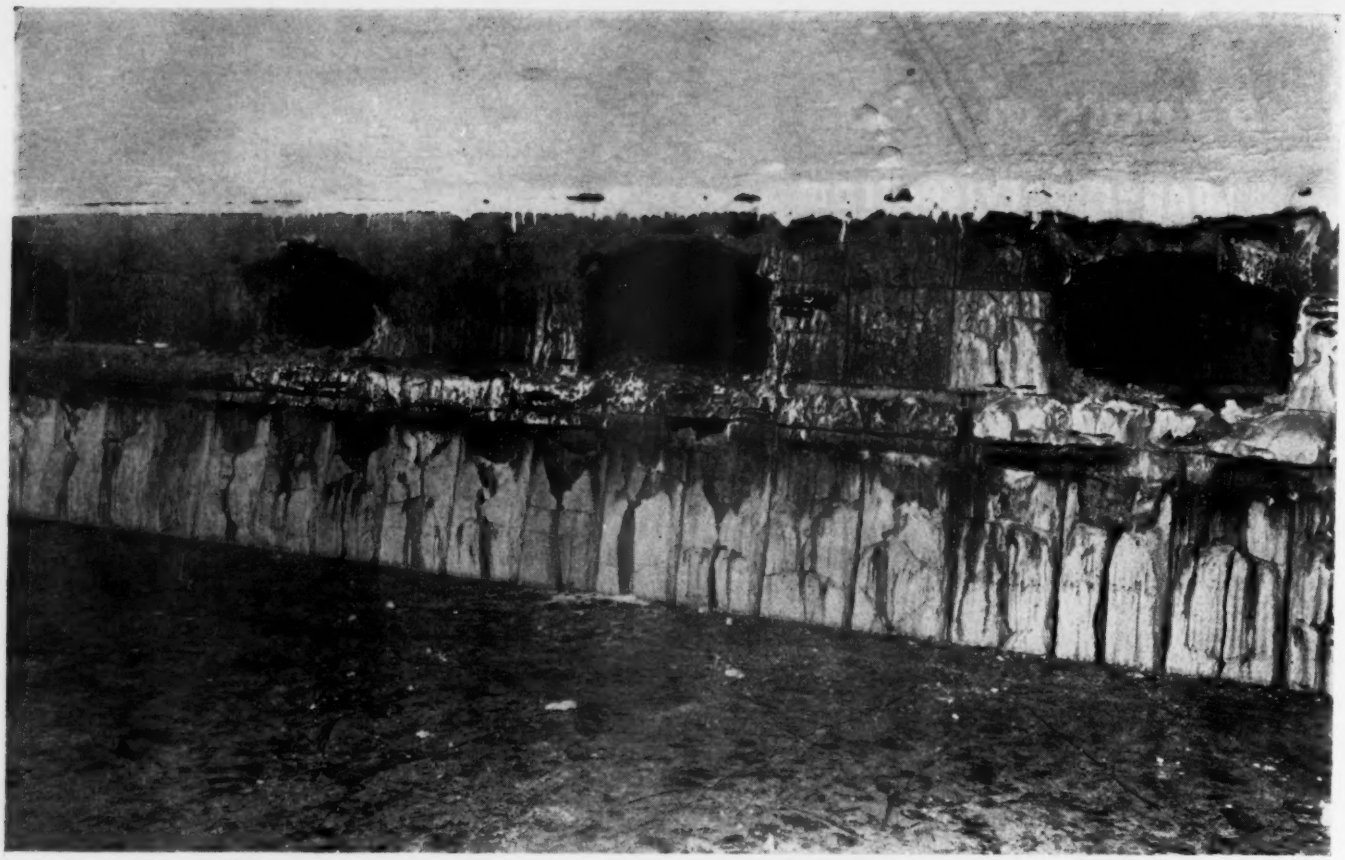
Norton Longer Lasting **Refractories**



PROGRESS WITH CORHART

The Corhart* Electrocast balanced tank shown above recently completed its second Corhart campaign on flint bottle glass. During its first Corhart campaign, the tank contained Corhart Electrocast throughout the melting-end sidewalls, throat, dog-house, and in portions of both the superstructure and the melting-end bottom. . . . For the second campaign, the use of Corhart Electrocast was extended to include additional superstructure, and a larger portion of the melting-end bottom (as well as the entire refining-end sidewalls, and a portion of the refining-end bottom).

The following is the operating data for both campaigns. We believe you will agree that the increased production figures fully justify the description above—"*Progress* with Corhart."

	8/14/39 to 1/8/42	3/5/42 to 1/19/45	Percent of Increase
Melting Area	770.5	770.5	0.0%
Total Days Life	870	1,051	20.8%
Total Operating Days	803	1,018	26.8%
Total Tons Glass Produced	75,631	102,899	36.0%
Tons Glass Per Day (Life)	87	98	12.6%
Tons Glass Per Day (Operating)	94	101	7.4%
Tons Glass Per Sq. Ft. Per Life	98.15	133.54	36.0%

On the third Corhart rebuild of this tank, now completed, the use of improved Corhart Electrocast products was extended. Further progress is expected. Corhart Refractories Company, *Incorporated,* 16th and Lee Streets, Louisville 10, Kentucky.

*Not a product, but a registered trade-mark.

QUALITY ECONOMY ENDURANCE

CORHART ELECTROCAST REFRACTORIES

Ceramic Abstracts Section

Compiled by

THE AMERICAN CERAMIC SOCIETY

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PERIODICAL REFERENCE: The name of the periodical appears in italics, followed by the volume (bold-faced), issue number (in brackets), page numbers, and year (in parentheses).

Vol. 24 **September 15, 1945** **No. 9**

Abrasives

Abrasive wheels. G. B. H. *Ind. Accident Prevention Bull.* (Roy. Soc. Prevention Accidents), Dec., 1943; abstracted in *Chem. Trade Jour.*, **114** [2980] 682 (1944).—The following points in relation to safety usage are stressed: (1) Speed above that stated on the wheel does not increase efficiency. (2) Rubber and Bakelite bonds are four times as strong as clay or water glass, and wheels containing them can be run at almost double the speed of the latter. (3) Grinding on the side creates the same effect as skidding into the curb with a car. (4) Portable abrasive wheels should be run at a lower speed than stated because of the unsteady support. (5) It is a statutory requirement (in Great Britain) that the safe working speeds be displayed for each wheel and spindle. (6) The mild-steel flanges must be of the same diameter and should grip at the edges. (7) Washers should be interposed between the flange and the wheel. (8) The (British) Factories Act requires that the eyes of the operator be protected with either goggles or transparent face screens. (9) Active dust must be removed. L.R.B.

Chemicomechanical lapping. Z. I. SHULVUG. *Stanki i instrument*, **15** [3] 26–27 (1944); *Ind. Diamond Rev.*, **5** [56] 148 (1945).—A lapping device for sintered carbide plates has been developed by the Russian State Optical Institute. By chemicomechanical action the cobalt bond of the sintered carbide is attacked, and the tungsten carbide grain is exposed. No heat is generated; hence no cracks develop, and waste is considerably reduced. For lapping, the sintered carbide plates are shellacked to a brass disk so that the faces to be lapped lie in one plane, no matter how thick the plates are. The lapping operation is speedily performed in a special machine of simple construction with a comparatively soft abrasive medium suspended in a 20 to 25% solution of $CuSO_4$. 1 illustration. P.G.

Diamond dust—a review of recent literature. ANON. *Ind. Diamond Rev.*, **5** [57] 169–71 (1945).—The production, grading, and uses of diamond powder in industry are reviewed. The difference between the uses of "loose" and "bonded" powders is explained, and the production methods are briefly described, with tables of nearest standard sieve equivalents and subsieve grades. The following applications are treated: diamond dies and diamond-tipped tools, the machining of synthetic sapphire and quartz, the grinding of sintered carbide tools and dies, and the preparation of diamond-charged laps. 24 references. P.G.

Diamond hones—a new development. F. WHITEHEAD. *Ind. Diamond Rev.*, **5** [57] 172–74 (1945).—W. describes the development of diamond hones for the truing of stainless steel cylinder sleeves. A honing tool that permits simultaneous inside and outside honing is shown. Six honing sticks are fixed rigidly to three adjustable jaws around the periphery. Vitrified, resin-bonded, and metal-bonded diamond hones of 150 grit $^1/_{16}$-in. abrasive layer are used. The honing is performed with a 65/35 mixture of paraffin and lard at a speed of 75 r.p.m. and 30 strokes per min. The last few strokes are performed at a speed of 50 r.p.m. Honing is usually followed by lapping with a silicon carbide with lard oil (4 lb. abrasive to 1 gal. oil) at a speed of 75 r.p.m. and 30 strokes per min. Vitrified hones produce about 2000 cylinder sleeves, while metal-bonded hones produce 5600. Surface finish down to an average of 0.8 micro-in. for internal and 1.4 micro-in. for external surfaces is obtainable but not necessary for production. The method may be applied to other hardened steel parts. 5 illustrations. P.G.

Diamond and sintered carbide wire-drawing dies, their maintenance and use. ANON. *Ind. Diamond Rev.*, **5** [56] 145–47 (1945).—A practical wire drawer and drawing-die expert deals with the maintenance and use of diamond and sintered carbide dies and with such problems as diamond powder, needle shape, centering and chucking, hand vs. machine polishing, and the economic use of diamond paste and drawing lubricants. P.G.

Dissipation of frictional heat in the mechanical process. J. C. JAEGER AND J. L. SOMERVILLE. *Paper Trade Jour.*, **119** [11] 103–108 (1944).—A theoretical study has been made of the dissipation of frictional heat produced when grinding wood pulp with a stone wheel. W.R.B.

Selection and treatment of the glue for polishing wheels. ANON. *Schleif-, Polier- u. Oberflächentech.*, **20** [11] 155 (1943); abstracted in *Chem. Zentr.*, **1944, I** [16] 956.—Only the best acid-free glues should be used, and they should be softened in distilled water and dissolved at a temperature not exceeding 60 °C. for not longer than 4 hr. M.HA.

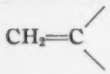
Silicon aerogel in protective coatings. I. V. WILSON. Address before Paint and Varnish Group, Chemical Inst. of Canada, Toronto, March, 1945; abstracted in *Can. Chem. Process Inds.*, **29** [5] 374, 376, 389 (1945).—The manufacture of the aerogel according to U. S. Pat. 2,093,454 is described. It is used in coatings as a flatting agent, as a surface hardener, as a means of controlling flow, and to produce body without tack or stringiness. See *Ceram. Abs.*, **24** [5] 88 (1945). B.L.

PATENTS

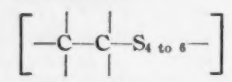
Abrasive articles. UNITED STATES RUBBER CO. Brit. 569,989, June 27, 1945 (June 24, 1943).

Abrasive articles. C. E. DRAKE (United States Rubber Co.). U. S. 2,381,266, Aug. 7, 1945 (June 24, 1943). 2 claims. Cl. 51-299.—1. An abrasive article comprising abrasive grains and a bond containing the vulcanization product of a mixture of rubber, sulfur in amount to vulcanize the rubber to hard rubber, and polymerized chloro-2-butadiene-1,3.

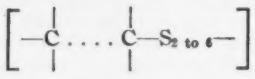
Abrasive articles. C. E. DRAKE (United States Rubber Co.). U. S. 2,381,267, Aug. 7, 1945 (June 24, 1943). 12 claims. Cl. 51-299.—1. An abrasive article comprising abrasive grains and a bond containing the vulcanization product of a mixture of a copolymer of a major proportion of butadiene and a minor proportion of a compound which contains a



group and is copolymerizable therewith, sulfur in amount to vulcanize the copolymer to a state comparable to hard rubber, and a material selected from the group consisting of a polymerized chloro-2-butadiene-1,3, copolymers of a major proportion of isobutylene and a minor proportion of a conjugated diolefine copolymerizable therewith, organic polysulfide polymer plastics which are polymers of substantially the structural unit



and organic polysulfide polymer plastics which are polymers of substantially the structural unit



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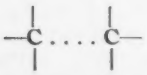

represents two carbon atoms joined to and separated by intervening structure.

Apparatus for introducing a coolant into grinding wheels. H. J. SCHEER (Abrasive Co.). U. S. 2,380,332, July 10, 1945 (May 27, 1943). 2 claims. Cl. 51-267.

Art of grinding annular surfaces. J. W. ALSDORF (Cory Glass Coffee Brewer Co.). U. S. 2,381,418, Aug. 7, 1945 (March 23, 1944). 6 claims. Cl. 51-209.

Automatic infeed and ejecting attachment for grinding machines. J. E. HECKETHORN, A. B. BOURG, AND E. J. LEONARD (Heckethorn Mfg. & Supply Co.). U. S. 2,379,961, July 10, 1945 (Aug. 2, 1943). 9 claims. Cl. 51-215.

Device for honing spiral grooves. J. E. KLINE AND C. S. WHITE (Micromatic Hone Corp.). U. S. 2,380,317, July 10, 1945 (Aug. 29, 1942). 13 claims. Cl. 51-184.3.

Disk diamond dressing tool. C. J. KOEBEL (Koebel Diamond Tool Co.). U. S. 2,380,451, July 31, 1945 (April 19, 1943). 6 claims. Cl. 125-39.

Drive for oscillating grinders. R. S. PYNE AND E. A. ALLEN (Van Norman Co.). U. S. 2,381,687, Aug. 7, 1945 (Nov. 14, 1941). 2 claims. Cl. 74-82.

Driving dog for grinders, etc. C. A. BAKER (1/2 to Peter Lenik). U. S. 2,380,381, July 31, 1945 (June 9, 1944). 2 claims. Cl. 82-40.

Grinding attachment for lathes. R. A. SCHRAMM (40% to E. S. Johnson). U. S. 2,380,335, July 10, 1945 (March 13, 1944). 6 claims. Cl. 51-259.

Grinding machine. P. H. HUTCHINSON (General Motors Corp.). U. S. 2,380,761, July 31, 1945 (Sept. 29, 1944). 11 claims. Cl. 51-103. W. M. BURA (Norton Co.). U. S. 2,381,034, Aug. 7, 1945 (March 4, 1942). 26 claims. Cl. 51-100. C. G. FLYGARE (Norton Co.). U. S. 2,381,123, Aug. 7, 1945 (May 22, 1944). 14 claims. Cl. 51-101.

Grinding and polishing substances. FRIED. KRUPP A.-G. (Fritz Stäblein, Hans Schrader, Franz Kölbl, and Helmut Stützel, inventors). Ger. 743,820, Jan. 3, 1944 (July 8, 1942); cl. 80*b*; abstracted in *Chem. Zentr.*, **1944, 1** [25/26] 1415–16.—For grinding and polishing hard metals, beryllium carbide and/or beryllium borocarbide is used, mixed with other grinding and polishing substances. M.HA.

Jig for supporting crankshafts during the machining or grinding of the crankpins. S. C. ROLLS. Brit. 569,865, June 27, 1945 (Nov. 29, 1943).

Machine for automatically grinding thread gauges, etc. W. J. BAUER (1/2 to J. L. Dudley and 1/2 to J. J. Moroney). U. S. 2,380,286, July 10, 1945 (July 10, 1942). 6 claims. Cl. 51-50.

Thread-grinding machine. FERNAND TURRETTINI (Soc. Genevoise d'Instruments de Physique). U. S. 2,380,883, July 31, 1945 (May 8, 1944; in Switzerland Nov. 27, 1943). 1 claim. Cl. 51-95. S. J. HARLEY AND J. E. WAINWRIGHT. U. S. 2,381,051, Aug. 7, 1945 (Aug. 14, 1942; in Great Britain Nov. 7, 1940). 6 claims. Cl. 51-95.

Wheel contour dresser. W. H. HAHIR (Schlage Lock Co.). U. S. 2,380,693, July 31, 1945 (March 15, 1944). 3 claims. Cl. 125-11.

Art and Archeology

Chinese porcelain in English mounts. LOUISE AVERY. *Bull. Metropolitan Mus. Art*, **2** [9] 266–72 (1944).—The Museum has recently purchased a superb group of five pieces of Chinese porcelain of the Wan Li period (1573–1619), with contemporary English silver-gilt mounts, from the estate of the late J. Pierpont Morgan. The porcelain is of excellent quality, ranking with the best blue and white of the period. The mounts, bearing the mark of a silversmith working in London about 1585, are fine examples of Elizabethan silversmiths' work. Such elaborately mounted Chinese porcelains are extremely rare; the few pieces still existing serve as landmarks in the story of English silver and the development of porcelain in Europe. Four of these pieces are said to have belonged to William Cecil, Lord Burghley, Lord Treasurer under Queen Elizabeth. There is no record of the history of the fifth piece before it came into the possession of Mr. Morgan, but it is similar in style, bears the same silversmith's mark, and is the handsomest of the group. 5 illustrations. A.A.A.

Color-tolerance specification. DOROTHY NICKERSON AND KEITH F. STULTZ. *Jour. Optical Soc. Amer.*, **34** [9] 550–70 (1944).—As means are developed for rapid color measurement, the need for a satisfactory method of expressing color tolerance and color fastness becomes increasingly apparent. A general small-difference formula is sought that can be applied to all colors, with tolerances expressed as some multiple of an index. 47 references. A.P.

Colorimeters and color standards. Report of Committee on Colorimetry, Chapter VIII. *Jour. Optical Soc. Amer.*, **35** [1] 1–25 (1945).—Colorimeters, systems of color standards, and methods of calibration suitable for the expression of their results in terms of the standard I.C.I. system are

described. 99 references. For Chapters II, V, VI see *Ceram. Abs.*, **23** [10] 164, 165 (1944); for Chapter VII see this issue, p. 174. A.P.

Defects in glazed ware. ANON. *Ceram. Ind.*, **44** [6] 82–84 (1945).—To obtain perfect ware, glaze slip must be applied properly, the atmosphere and temperature of the kiln must be controlled, and proper color formulas are essential. The various defects of glazes and their evaluation are discussed. 1 illustration. H.T.

Distribution of color matchings around a color center. L. SILBERSTEIN AND D. L. MACADAM. *Jour. Optical Soc. Amer.*, **35** [1] 32–39 (1945).—Experimental data on the accuracy of visual chromaticity matchings are compared with predictions based on the assumption of a normal frequency distribution in two dimensions. Previous conclusions based on graphical analysis of the data are confirmed, eliminating the former dependence upon personal judgment. A.P.

Enameled-glass bottle of the Mamluk period. M. S. DIMAND. *Bull. Metropolitan Mus. Art*, **3** [3] 73–77 (1944).—Although Syrian glassware was famous in ancient times, the various methods used in its decoration were gradually perfected under the Muhammadan dynasties. The greatest era of Islamic glass began in the 12th century and reached its climax in the 13th and 14th centuries under the Ayyubid and Mamluk rules. The art of enamel painting on glass was developed by the craftsmen of this period. The glass bazaars of the Syrian cities Aleppo and Damascus were filled with richly decorated ware, which was famous all over the East and exported even to China. Much of this glass found its way through Europe, and in the 15th century the art of enamel painting and gilding was introduced in Venice, probably by Syrians. The Metropolitan Museum possesses one of the finest collections of Islamic glass of the 13th and 14th centuries. The most magnificent of these richly decorated pieces is a large bottle recently acquired (illustrated). This masterpiece of Mamluk glass was formerly in the collection of the Austrian imperial family of Hapsburg and was exhibited in the Kunsthistorisches Museum in Vienna. The elaborate gilt and enamel-painted decoration covering almost the entire surface of the bottle surpasses all other known examples of Mamluk glass in brilliance of color and beauty of design. The bottle was made in the first half of the 14th century. A medallion, one of three on the shoulder of the bottle, formed by interlaced bands and filled with dense patterns of arabesques in red and gold, with touches of white, red, and green against a brilliant blue background, is illustrated. These medallions are reminiscent of the stained-glass windows of the medieval churches of Europe. Below the medallions is a frieze of fighting warriors on horseback. The headgear of the warriors varies. Some wear turbans and others caps and helmets, suggesting that a battle between Arabs and Mongols is being depicted. Chinese influence spread through the Near East by the Mongols is evidenced by the skillfully drawn horses and the bands on the neck of the bottle showing cloud motifs and a phoenix, as well as arabesques and delicate floral scrolls in gold. The color range of the enameled decoration of this bottle is much greater than that of the Mamluk glass of the second half of the 13th century. The new bottle probably dates from about 1320 and belongs to the period of Sultan Nasir ad Din Muhammad ibn Kalaun. Of this same period the Museum owns a large standing cup presented by Mr. and Mrs. V. Everit Macy and a fine bottle from the collection of Baron Robert de Rothschild in Paris. An enameled-glass mosque lamp and an enameled-glass cup (second half of the 13th century), in which the gilt decoration predominates over the enameled, are also illustrated. A.A.A.

Melusa's prize. MARJORIE J. MILNE. *Bull. Metropolitan Mus. Art*, **3** [4] 110–12 (1944).—A handsome Greek drinking cup, an early example of the eye kylix (named from the enormous talismans against the evil eye which decorate each side), is a type of Attic pottery of the early 6th century B.C. Under the handles and between the eyes on one side are battle scenes, and on the other side a warrior leads away a woman captive. An inscription, "I am Melosa's prize. She won the girls' carding contest," scratched on the bottom, is in a western dialect (Doric). The cup was found at Tarentum, and the dialect is probably Tarentine. Melosa (or Melusa as it would be in Attic dialect) may have been the name of the girl who received the prize, her pet name, or, if the contest had some connection with a religious observance, a name referring to a mythological character to be honored. The cup is $4^{13}/_{16}$ in. high and is intact except for a few small breaks on one side. 3 illustrations. A.A.A.

Message to ceramic designers. CHARLES M. HARDER. *Ceram. Ind.*, **44** [6] 76–78 (1945).—It is believed that American art pottery, highly developed during the war, will be able to hold its own against future importation of ceramic artware if ceramic procedures and mechanization are adopted without sacrifice of quality. H.T.

Notes on the problem of color harmony and the geometry of color space. ARTHUR POPE. *Jour. Optical Soc. Amer.*, **34** [12] 759–65 (1944).—P. comments on the articles on color harmony by Moon and Spencer (see "Geometric . . .," "Area . . .," and "Aesthetic . . .," *Ceram. Abs.*, **23** [10] 164 (1944)). **Reply to Arthur Pope.** PARRY MOON AND D. E. SPENCER. *Jour. Optical Soc. Amer.*, **34** [12] 765 (1944). A.P.

Terra cotta monument honoring the invention of the balloon. PRESTON REMINGTON. *Bull. Metropolitan Mus. Art*, **2** [8] 241–48 (1944).—To commemorate the first successful balloon ascensions in 1783, in France, Louis XVI intended to erect a monument honoring the achievement. The monument was never erected, but several artists made models for such a monument to be set up in the Tuileries gardens. The Museum has acquired a terra-cotta model by Clodion (Claude Michel, 1738–1814), made in 1784 in commemoration of the invention of the balloon. Height of the model is 44 in. It is made in two shades of terra cotta, in two parts, both inscribed "CLODION." This unusual example of Clodion's work buoyantly reflects the rococo spirit of 18th-century France and the exhilarated and amazing atmosphere in which the early ascensions took place. An alternate terra-cotta model for the proposed monument, height about 24 in., was also made by Clodion. 5 illustrations. A.A.A.

BOOK

Handbook of Ornament. FRANZ SALES MEYER. Wilcox & Follett Co., Chicago 5, 1945. 548 pp., 300 full pages of illustrations. Price $2.50.—Almost from the beginning of time the fine art of decoration and ornamentation, whether ornate or simple, has been applied to the limitless array of things—both ordinary and extraordinary—with which we have daily contact. Primarily, A Handbook of Ornament is intended for the use of art students, designers, interior decorators, potters, jewelers, and professional artists; yet to the layman who gives thought to the history behind ornamentation, this book can open a clear, interesting path to keener understanding and appreciation. The material in A Handbook of Ornament is especially useful, for it contains the historical and factual information usually contained in several works on the subject. Most of the books on ornament arrange their material according to periods and nations, but this book bases its subject matter on the construction and development of the elements of ornamentation. Because the antique period was one in which decoration and ornamentation reached a glorious height of expression, a comparatively large share of attention has been given to it.

This edition contains a scholarly foreword by Meyric Reynold Rogers, curator of the department of decorative arts and the department of industrial arts of the Art Institute of Chicago since 1939. Mr. Rogers says: "Meyer's A Handbook of Ornament is a classic. This in itself may not be sufficient reason for republication. There are many classics which are scholarly essentials but which are of immediate use to so comparatively few that their reissue is the concern of specialists only. This is not true of A Handbook of Ornament, however. For, though it is from one point of view essentially a textbook and as such particularly susceptible to the passage of time, it still remains

one of the few compendiums of factual information in a field which is of increasingly vital concern—the field of design.

"A generation ago no designer or student, no office or drafting room concerned with the arts or with industrial design could afford to be without a copy. The complete English edition of 1892, translated from the German text in 1888 by Hugh Stannus of the South Kensington School of London, was in wide demand but becoming hard to obtain. The first section was reissued as a school textbook by Bridgman in New York in 1928, but until the present, no complete American printing has ever appeared.

"Like any good dictionary, this volume contains much that is not of current use. Many of the forms and much of the material selected may not be in accord with the taste of our day. But just as no creative writer or student of literature is obliged to use all the words in a dictionary, neither is any designer compelled to use everything he finds in A Handbook of Ornament. Nor is any student expected to regard any or all of it as sacrosanct per se. The main consideration is that the material is lavishly provided, arranged logically for impartial study, and clearly presented in an impeccable if somewhat dry line offering the least possible ambiguity. Certainly the numberless books on ornament which have appeared in the last fifty years have been useful supplements to A Handbook of Ornament, rather than substitutes for it. Granted that the current mode makes historical ornament and ornament for its own sake suspect and undesirable, the facts of the case suggest that tomorrow may be of another mind. Anyway, no competent instruction in design can neglect the study of ornamental form without grave peril. Hence, until something better appears, A Handbook of Ornament should always be within reach as a stimulus if not as a vade mecum."

PATENTS

Production of pictures on glass blackened with silver. FEDERICO CERATI. Ital. 396,047, Jan. 15, 1941; abstracted in *Chem. Zentr.*, **1944, II** [1/2] 62.—The picture is drawn, and its area is coated on the completely blackened glass plate with a colored dammar-resin solution. The glass plate is then treated with a solution that dissolves the black silver layer so that the parts not coated with the resin solution and free of the picture are freed of silver. After removal of the excess solvent, the coating film of the picture is removed. M.HA.

Transfers for pottery and other goods. H. TAYLOR. Brit. 569,997; June 27, 1945 (Nov. 6, 1943).

Cements

Cement industry in retrospect and prospect. J. F. KAUFMAN. *Pit and Quarry*, **38** [1] 80–81 (1945).—In discussing the past and future of the Portland cement industry, K. touches upon (1) labor, (2) new cements, and (3) new equipment. M.R.

Chloroform soluble content control of air-entraining Portland cements. E. S. ERNST AND R. A. LOVELAND. *Pit and Quarry*, **38** [1] 119–22, 128 (1945).—The authors describe their method for determining the chloroform-soluble content of Portland cement. It is said to be an improvement on the A.S.T.M. method (C114–42) and more adaptable to control testing, which involves many and frequent tests. 3 diagrams. M.R.

Effect of carbon dioxide on cement mortar and concrete. R. GRÜN AND K. OBENAUER. *Zement*, **33**, 10–12 (1944); abstracted in *Chem. Zentr.*, **1944, II** [1/2] 61–62.—Experiments extending over 8 years showed that alumina cement is not at all damaged by carbon dioxide and that the general resistance of mortar and concrete to strongly aggressive CO_2-containing water is relatively high. To avoid lixiviation of lime, dense work, coating, and the tamping of loam are recommended. M.HA.

Methods and procedures for testing the properties of Portland cement. G. A. ASH. *Pit and Quarry*, **38** [1] 73–75, 78 (1945).—A. discusses cement testing, both chemical and physical, and concludes that there is still an element of uncertainty in the results produced by common methods of testing. He quotes the opinion of one authority that should this element of uncertainty be recognized, "many of the statements of the quality of cement and predictions regarding its future deportment in service would not be made with the positiveness and finality which now characterize them." 10 references. M.R.

Rings in cement kilns: I. HAROLD GINGERICH. *Rock Products*, **48** [6] 89–90 (1945).—Ring-formation problems are encountered in all cement kilns to a greater or lesser degree. Slurry rings composed of raw materials with some coal ash form in the preheating zone, whereas clinker rings form from the calcining zone to the end of sintering zone. Factors favoring clinker-ring formation are (1) a raw mix with a low SiO_2-Fe_2O_3-Al_2O_3 ratio, (2) uneven composition of mix, (3) excessively coarse mix, (4) high Al_2O_3 content of mix, (5) high Fe_2O_3, (6) low SiO_2, (7) low CaO unless SiO_2 is high, and (8) a reducing atmosphere. B.C.R.

PATENTS

Manufacture of a cement mass impermeable to water. CARLO GRANDORI AND PAOLO ROVESTI. Ital. 392,540, July 30, 1941; abstracted in *Chem. Zentr.*, **1944, I** [25/26] 1418.—The mass (**I**) is made by the addition of aluminum silicate hydrate. A cement mass of medium coarseness is made up of 300 to 400 cement, 180 fine sand, and 90 kg. **I**; to this is added 33% sand (0.3 mm.), 37% fine gravel (3 to 40 mm.), and 170 kg. water. The figures are given for 1 sq. m. M.HA.

Manufacture of light or foam slag for light concrete. DET NORSKE AKTIESELSKAB FOR ELEKTROKEMISK INDUSTRI. Belg. 446,691, May 29, 1943 (Aug. 1, 1942); abstracted in *Chem. Zentr.*, **1944, I** [25/26] 1418.—Liquid slag is brought into intimate contact with an excess of water in an inclined rotating drum so that a foamy mass is formed, which, in the plastic state, is passed over a sieve and then between compressing rolls to a conveyer that transports the porous, hard material to the mill. The ground product is made into light concrete with an addition of cement. M.HA.

Enamel

Automatic pickling and processing before enameling. ERNEST H. LYONS, JR. *Ceram. Ind.*, **44** [6] 53 (1945).—Automatic conveyers for cleaning, pickling, and processing before enameling are described. The advantages are enumerated. H.T.

Enamel compositions in American, European hollow-ware industries. PAUL A. HUPPERT. *Ceram. Ind.*, **44** [5] 112–13 (1945).—While single-coat ware is popular in the U. S., it is produced only for export in Europe. White coat enamels are of standard types in Europe but vary considerably here. Silica-free enamels are discussed, and a typical formula is given. H.T.

Essential war work keeps enameling plant busy. R. E. BRAGGINS. *Finish*, **2** [6] 17–20 (1945).—B. describes the various types of manufacture engaged in by the Erie Enameling Co. during the war. W.R.B.

Malleabilization of white cast iron. E. E. HOWE. *Better Enameling*, **16** [5] 6–8 (1945).—A satisfactory malleable casting can be obtained from white cast iron by holding at 1650°F. for 15 hr., cooling rapidly to 1250°F., and holding for 20 hr., followed by air cooling to room temperature. A one-coat cast-iron enamel was applied satisfactorily in accordance with standard enameling procedures. B.C.R.

One-coat one-fire finish depends on shop practice. EUGENE WAINER. *Ceram. Ind.*, **44** [5] 114 (1945).—Fully killed steel (treated with ferrotitanium) forms a satisfactory base for the application of white cover coats without the use of ground coat. W. discusses the precautions which should be taken to obtain a satisfactory coat. Special emphasis is put on pickling practice. A firing temperature 20° to 30° higher than normal should be used. H.T.

Porcelain enameled interior and exterior. ANON. *Finish*, **2** [6] 25 (1945).—A practical application of porcelain enamel in Cleveland restaurants is described. W.R.B.

Preparation of specimens for microscopic examination. FRANK J. CERMAN. *Better Enameling*, **16** [6] 6–10 (1945).—Samples of uncoated enameling iron or other thin sheet metals may be mounted in Bakelite or similar plastics. Enameled samples are mounted in low-melting alloys, e.g., one containing 20 Sb, 60 Bi, and 20% Sn. Fine polishing is carried out on a wax-impregnated billiard-cloth wheel, using an abrasive solution having a concentration of 1 oz./100 ml. water to which has been added a small quantity of mild soap or wetting agent. Chrome oxide is used for extremely fine polishing. Cleanliness is essential for obtaining satisfactory results. B.C.R.

Properties and uses of several clays in porcelain enamels. RALPH L. COOK. *Jour. Amer. Ceram. Soc.*, **28** [8] 206–17 (1945).—5 references, 9 figures.

Sign plant modernizes. C. S. OWEN. *Finish*, **2** [7] 13–16, 52 (1945).—The plant-improvement program of the Atlas Enameling Co., St. Louis, is described. W.R.B.

Tappan's "first" range—officials consider new improvements. ANON. *Ceram. Ind.*, **44** [6] 54–58 (1945).—The Tappan Stove Co., Mansfield, Ohio, is ready to reconvert from war production to the manufacture of gas ranges and other civilian products. It is planned that the postwar range will be constructed from a unit body. 16 illustrations. H.T.

PATENTS

Manufacture of enamel for wet enameling. I. G. FARBENINDUSTRIE AKT.-GES. Belg. 448,573, July 30, 1943 (Dec. 31, 1942); abstracted in *Chem. Zentr.*, **1944, II** [1/2] 62.—To the enamel is added, in the mill or as a paste, 5 to 10% of a compound of AlF_3 and an alkali metal (cryolite) or other compound of fluorine, alone or mixed with the usual binders. M.HA.

Glass

Armstrong's glass research aided by varied interests. ANON. *Glass Ind.*, **26** [7] 321–23, 338, 340 (1945).—A tour through the Research Laboratory of the Armstrong Cork Co. at Lancaster, Pa., discloses the diversified character of the manufacturing and research interests. Ten photographs and cover illustration. A.P.

Basic regenerators and superstructures for glass tanks. R. G. ABBEY. *Glass Ind.*, **26** [6] 279–81, 296 (1945).—Unburned basic brick have been accepted for several applications in glass furnaces since their success in checkers (see "Basic . . . ," *Ceram. Abs.*, **20** [7] 169 (1941)). Because basic brick do not react with batch dust to form slag, they have been used at entrances and uptakes to keep slag out of the regenerators. Unburned chrome brick are being tried in regenerator crown, port sidewalls, and port crown. A protective action on silica-alumina port floors has been noted. Two courses of unburned chrome brick laid flat on top of the division walls in the uptakes of a producer gas fired furnace were almost intact after a 15-month campaign. Elimination of drip from superstructures makes practical the use of cheaper refractories below the first 14 courses in the checkers provided a novel basket-weave brick setting is used in the first 8 courses. The combination of unburned chrome superstructures with unburned magnesite basket-weave settings should enable hot-tank operators to forget checker replacements in rebuilding and uptake replacements for two or three campaigns. Insulation of these basic superstructures is feasible, resulting in higher checker temperatures, fuel economy, and more comfortable working conditions. 7 photographs. A.P.

Calculation of density and specific-gravity data for container glasses: corrections for temperature and air buoyancy. MELLEN A. KNIGHT. *Glass Ind.*, **26** [4] 173–75, 198–99 (1945).—Each density value must be expressed to represent the glass at some known temperature if it is to have significance in comparison with other data. A standard temperature of 20°C. is recommended. Data obtained at other temperatures can be corrected to the standard temperature by graphs, factors, and calculations shown. Although these refer particularly to soda-lime container glasses, similar factors can be easily derived for other types. The densities of these glasses linearly decrease 0.00007 gm./cc./+1°C. Changes in specific gravity are not linear, but a curve gives the corrections. A.P.

Correct methods for installing Thermopane. ANON. *Amer. Builder*, **67** [7] 94–95 (1945).—Owing to a great many inquiries, instructions for installing Thermopane are given together with self-explanatory diagrams. 14 diagrams. See "Insulating . . . ," *Ceram. Abs.*, **24** [2] 38 (1945). M.R.

Electronic requirements develop glass-to-metal adherence. JOHN-LANGDON DAVIES. *Glass Ind.*, **26** [6] 302 (1945); see "Metal- . . . ," *Ceram. Abs.*, **24** [1] 8 (1945). A.P.

Factors affecting melting capacity of tanks. A. E. BADGER, G. H. JOHNSON, AND J. H. HEALY. *Ceram. Ind.*, **44** [5] 118–20 (1945).—Laboratory tests, some confirmed in practice, show that many factors affect the melting capacity of tanks, including reductions in viscosity, the use of a moist batch, and briquetting of the batch. 6 references, 4 diagrams. H.T.

Fiberglas decorative fabrics for drapery use offered by stores to test market reaction. ANON. *Amer. Glass Rev.*, **64** [34] 11 (1945).—Decorative fabrics made of Fiberglas are being quietly introduced to institutions, decorators, and department stores to test the market reaction. Fabrics being shown are 36 in., 50 in., and wider prints, plain and in moss-rose, flock-dot, and damask effects. A.P.

Furnace operation and control: I, Furnace "heat-up." ROY S. ARRANDALE. *Glass Ind.*, **26** [1] 19–21, 36 (1945).—Continuous regenerative furnaces should be heated up for a constant rate of expansion. A family of time-temperature curves shows the rates from 0.010 to 0.025 in./ft./day. The curve for 0.018 in./ft./day is considered ideal, and an actual schedule for an oil-fired furnace is described in detail. **II and III, Furnace operation.** *Ibid.*, [2] 75–77, 88, 92, 95; [3] 128–30, 147.—Steady state temperature-distribution curves representative of the ideal are based on the bridge-wall temperature as zero and are measured optically through the travel from charge to discharge. The significant features of the curves are discussed, especially the hot spot around the middle of the ports and the importance of disappearance of batch beyond this region. Furnace performance is best when the hot spot is 50° to 75°F. higher than the bridge wall and the proper distance halfway down the melter length. When the hot spot is too close to the bridge wall, cordy glass develops. No two furnaces are alike, and each has various points of distinction. Characteristics of five specific furnaces are appraised. Glass composition affects furnace performance. Silica exacts the major influence, an increase from 72.5 to 75.5% raising operating temperatures 100°F. or changing capacity about 20%. The effect of cullet is not as great as might be expected. **IV, Furnace control.** *Ibid.*, [4] 177–79, 190–91, 196.—A daily operating report is of valuable assistance to process control. Devices essential for good furnace control are (1) fuel regulation and indication, (2) optical pyrometer, and (3) portable Orsat; further refinements, in order of importance, are (4) automatic batch feeding, (5) automatic pressure con-

trol, (6) automatic combustion-air control, and (7) temperature recording. Control equipment is diagrammed and compared for oil, natural-gas, and producer-gas firing. 20 illustrations. A.P.

Glass fiber blankets absorb sound in planes. ANON. *Science News Letter*, **47** [21] 328 (1945).—Sound insulation on multiengined bombers is accomplished with blankets composed of downlike glass fibers as thin as 0.0005 in. in diameter. G.A.K.

Glass fibers show good column packing characteristics. ANON. *Chem. Industries*, **53** [7] 843–44 (1943).—The use of glass fibers for packing in distillation columns has grown out of demands for a substitute for the tinned copper bubble plates generally used in alcohol columns. Glass-fiber packing appears to possess all the characteristics of a satisfactory material, including good rectifying performance, high rate of throughput with low pressure drop, low hold-up, consistent behavior, light weight per unit volume, and low cost. See *Ceram. Abs.*, **22** [10] 170 (1943). E.D.M.

Glass furnace in service 100 months. A. L. PASQUIER. *Ceram. Ind.*, **44** [5] 122 (1945). H.T.

Glass house of future to be practical and economical. ANON. *Amer. Glass Rev.*, **64** [34] 18 (1945).—Alexander Silverman, in the *Pittsburgh Post-Gazette*, predicts that the house of the future will be built of hollow glass tile or of Foamglas and will have a plate-glass veneer, glass-fiber insulation, and glass roof, plumbing, furnishings, and mattresses. It will be heated by glass floors, and the glass walls will glow in color. A.P.

Glass law suits—1944 review. LEO T. PARKER. *Ceram. Ind.*, **44** [6] 62–63 (1945). H.T.

Glass research institute founded in India. ANON. *Glass Ind.*, **26** [4] 182 (1945).—The Central Glass and Silicate Research Institute will be established in Calcutta, India, with an initial staff of twelve research workers and thirty-two helpers. The chief functions will be experimental investigation of problems in the field of glass technology, the testing and standardization of materials and glassware, the collection and distribution of technological information, and the education of glass technologists. The annual budget of $50,000 represents 1% of the prewar total production value of India's 150 glass factories. A.P.

Glass Science Research Foundation reviews one year's activities. W. A. WEYL. *Mineral Industries* [Penna. State Coll.], **13** [8] 1, 4 (1944); reprinted in *Glass Ind.*, **26** [4] 194 (1945). A.P.

Glass temperatures measured by radiation elements. JOHN R. GREEN. *Ceram. Ind.*, **44** [6] 64 (1945).—A further comment on tank control. See "Valuable . . . ," *Ceram. Abs.*, **24** [5] 85 (1945). H.T.

Glass—types and composition. ANON. *Metals and Alloys*, **21** [6] 1673 (1945).—Chemical compositions and typical physical characteristics of twelve types of glasses are given. B.C.R.

Government charges flat-glass industry with monopoly. ANON. *Glass Ind.*, **26** [6] 282, 294 (1945).—The Department of Justice has filed suit in the U. S. District Court at Toledo against nine flat-glass manufacturers and the National Glass Distributors' Assn., charging monopolistic activities. A verbatim account of the Justice Department's news release is given. A.P.

Hartford-Empire develops inspector for finish checks. ANON. *Glass Ind.*, **26** [4] 176, 203 (1945).—A fully automatic jar-inspecting device, known as the Hartford 74 Check Inspector, is the first of a series under development by the Hartford-Empire Co. The orientation of finish checks in contact with the vacuum-sealing gaskets can dissipate the vacuum in a short time. Visual inspection can easily miss such checks. In adapting an electronic system, the problem was simplified to include only checks at the finish rim, passing in a plane through the sealing surface of the jar. To differentiate between these checks and harmless seed, the reflected ray is confined to a narrow, vertical shaft. Vertical plunger scratches on the inside of the finish will also cause rejections, and this should tone up forming operations by anticipating operational troubles. The 74 Inspector has two parts: a revolving turret having eight carriers into which jars are loaded automatically as they come from the lehr and an electronic-optical unit. A conveyer system will handle the containers from lehr to inspector to packing table. An experimental trial on a carload of food jars led to rejection after packing of only one jar out of approximately 480,000. A.P.

How the glass industry can contribute to full peacetime employment. CLINTON DAVIDSON. *Glass Ind.*, **26** [7] 328–30, 350 (1945).—National prosperity with a high level of employment at proper wages is dependent on revision of tax laws to encourage risk capital. The history of the growth of the glass industry under corporate industry illustrates the increased productivity per worker and higher wages which have attended increased investment in mechanization. A.P.

Modern developments in glasses for technical purposes. W. E. S. TURNER. *Endeavour*, **4** [13] 3–16 (1945).—Although glass formerly owed its importance to transparency, it is finding increasing uses in industry for other reasons. To be of value as a constructional material, it must be durable, strong, chemically resistant, nonspalling, or perhaps of high electrical resistance. Chemical and thermal endurance go together and are obtained from alumina and boric oxide (within limits) with silica. Vycor, Pyrex, Hysil, and direct-flame cooking glass are of this kind, having a low coefficient of expansion. Thick glass sheets, miners' lamp well glasses, lenses for setting in concrete, power-line insulators, and tumblers can be tempered by rapid cooling of the outside to resist impact and sudden changes of temperature. Pipe lines up to 12 in. in diameter are used in the chemical industry as coolers for acids, etc. The compressive strength of glass is high and not accurately known, since failure is always by tension. The tensile strength depends on the dimensions of the test piece. Multiple laminated glass has been used for bomb aimers' windows; it must not splinter on the inside when struck with a 0.303 Mark I bullet. Glass and glass-to-metal seals are dealt with in the section on electrical apparatus. For successful sealing the following factors are required: (1) similarity of thermal expansion, (2) a series of glasses of graduated coefficients of expansion failing (1), (3) soft glasses or malleable metals, (4) clean metal, (5) careful annealing, and (6) good design. Reference is made to the glasses, alloys, and metals used. It is possible to seal glass to metal differing by 10% in expansion rate, if close attention is paid to the other points. Four processes for the manufacture of glass fibers are briefly referred to. 26 illustrations. L.R.B.

Optical progress in Australia. ANON. *Optician*, **109** [2822] 217 (1945).—Australia's war-created optical industry is producing lenses, prisms, range finders, dial sights, periscopes, telescopes, cameras, and antiaircraft predictors amounting to $1,500,000 annually. The industry was founded on initial research, small-scale production, and the development of machinery and testing instruments at the University of Tasmania. More than 500 workers are employed. The nucleus of the staff included many refugees. A.P.

Photographic lens system. A. ESTELLE GLANCY. *Jour. Optical Soc. Amer.*, **35** [4] 307–308 (1945).—A photographic lens system incorporates a very weak meniscus lens to correct spherical aberration and sine condition and extend aperture ratio at no expense to color and field curvatures and chromatic variation of the spherical aberration. A.P.

Practical applications of metallic and nonmetallic films on optical elements. DEAN A. LYON. *Jour. Optical Soc. Amer.*, **35** [2] 157–61 (1945).—No developments of a startling character have been made during the war with respect to metallic reflecting films. Silver still retains its supremacy, far out-distancing its nearest competitor, aluminum, in quality and quantity. Rhodium plating on glass has been developed, but details of the method are still secret and reflectance is only about 75%. In films for light-transmitting elements, one of the outstanding developments in the field of optics has taken place. The vacuum coating process has been transformed from a laboratory toy into a thriving industry, having equipment

valued at more than a million dollars. Practically every piece of optical glass being made for the armed forces is being coated. Magnesium fluoride is generally used for the film material because of hardness, durability, and stability, even though its refractive index is higher than the optimum. High-reflection films of zinc sulfide are utilized for beam splitters. Applications include two observers using one optical system or sending yellow rays toward the eye and blue rays to a camera. Double-layer films promise increased efficiency. Attempts are being made to use thin films to improve the durability of front-surface mirrors of silver or aluminum. Peacetime applications to camera lenses, spectacles, watch crystals, clock faces, instrument cover glasses, and large-surface windows in automobiles, railroad cars, stores, and homes will probably become a permanent feature of our industrial setup. A.P.

Prefab full of postwar ideas. ANON. *Amer. Builder*, **67** [7] 84–86, 138 (1945).—A new "solar" house erected at Rockford, Ill., is described. Its counterpart will soon be put into production and will be supplied in a prefabricated state. It incorporates many new construction ideas, materials, and equipment. It has a large glass area intended for a southern exposure. All windows are "picture windows" and equipped with double plate-glass panes which will eliminate storm sash. The glass to be used will be Thermopane. 10 illustrations. See "Insulating . . ." *Ceram. Abs.*, **24** [2] 38 (1945). M.R.

Projection of light. FRANK BENFORD. *Jour. Optical Soc. Amer.*, **35** [2] 149–56 (1945).—B. discusses the distribution of light in a searchlight beam and some of the characteristics of a projected beam, contrasting lenses with the ellipsoid and hyperbola. Filament images can be suppressed by designing mirrors with a combination of these curves. A.P.

Proposed method of specifying appearance defects of optical parts. J. H. MCLEOD AND W. T. SHERWOOD. *Jour. Optical Soc. Amer.*, **35** [2] 136–38 (1945).—Because a large fraction of the cost of a finished lens or prism comes from the special care necessary in the various operations and from the unavoidable losses along the whole chain of operations, it is important to be able to specify the permissible amount of defect as exactly as possible. At the Hawk-Eye Works of the Eastman Kodak Co., a system of quality inspection based on graded samples has recently been put into use. Defects have been put into three main classes: scratches, digs, and poor polish. Scratches refer to all long defects, and five standard disks mounted in a glass-sided box represent scratch widths in microns at intervals of 10, 20, 40, 80, and 120. Shape and length are also important, and rules governing their interpretation are printed on the box. Digs include all round-appearing defects and are designated by the size numbers 10, 20, 40, 70, and 100, which are a measure of mean diameter in hundredths of a millimeter. One maximum size defect is allowed per lens up to 20-mm. diameter, and one extra for every additional 20 mm. Smaller defects may be more numerous. On surfaces to be cemented, open bubbles may not be larger than half the permissible size. A.P.

Recent studies on the fluorescence of glass. N. J. KREIDL. *Jour. Optical Soc. Amer.*, **35** [4] 249–57 (1945).—While the application of fluorescing glasses to illuminating engineering is still under consideration, the phenomenon itself has been developed into a useful tool for investigating the constitution of glass. The light emitted by a fluorescent unit in a glass is utilized as an indication of the location of the unit and of the nature of the unit's surroundings. Structural changes in the same glass with heat-treatment or different structures in glasses of different composition affect the energy and therefore the color and intensity of the fluorescence. Fluorescence is affected by structural changes in the glass as follows: (1) The more the fluorescence center is disturbed by the surroundings, the more is intensity decreased and are wave lengths shifted toward red. Interpretation of these changes can extend the evidence of X-ray analysis to more complex glasses. (2) The narrowing of fluorescence bands indicates increasing symmetry of the environment and aids the evaluation of structural differences between crystals and glasses of equal composition, especially as a function of temperature. (3) Fluorescence of longer duration accompanies increasing viscosity and less-frequent collisions. Present problems in the constitution of glass include extension of the geometrical picture of atomic arrangements to take account of the actual electrical fields around atoms, not just symmetrical charges about hypothetical spheres. The influence of charge distribution, polarization, and polarizability becomes manifest, especially in the case of ions of non-noble gas character. Divalent ions like Zn^{2+}, Pb^{2+}, and to a certain extent Ba^{2+} can assume the role of glassforming cations because of the field created by a particular electron distribution. The most suitable fluorescence center for intensity studies is the uranyl group, UO_2^{2+}. When a stronger network is formed, the fluorescence intensity of the uranyl increases. A comparison of the intensity-distribution curves of uranyl in potassium, sodium, and lithium glasses demonstrates that lithium causes the greatest disruption of the $Si—O_4$ network. Europium is useful for structural analysis because its fluorescence bands and lines are well defined. The position and width of the 5790-a.u. band shifts, depending on whether the europium is in a crystal, concentrated solution, diluted solution, or a glass. Divalent manganese produces fluorescence colors changing from green to red. In studying optical and filter glasses, K. has made molecular replacements on the basis of the following systems: (1) Na_2O–$4SiO_2$, (2) Na_2O–$2SiO_2$, (3) Al_2O_3–Na_2O–P_2O_5, (4) Al_2O_3–BaO–ZnO–P_2O_5. The effects on the green-red balance are represented graphically and form the basis of the conclusions: (*a*) When the ratio SiO_2 to Na_2O is decreased, the structure is loosened. (*b*) Li^+ has the strongest influence among the alkalis, and the shifts can be correlated with their field strengths (charges over square of apparent radii). (*c*) When divalent oxides replace half of the Na_2O, the loosening effect increases in the order Sr, Ba, Pb-Ca-Na equivalent, Mg, Zn. Divalent ions are capable of a considerable strengthening effect, and the substitution for Na^+ of Ba^{2+}, Sr^{2+}, Pb^{2+}, and even K^+ acts much more like an addition of SiO_2 than would be expected from the distinction between glass formers and modifiers. (*d*) TiO_2 strengthens the structure, but the substitution of B_2O_3 for SiO_2 loosens it. (*e*) In phosphate glasses the addition of Zn or Al strengthens the network and Na weakens it. The wave length of the ultraviolet light also affects the color and intensity, and the availability of sterilizing lamps makes accessible the shorter wave lengths which produce some characteristic fluorescence in nearly every glass. This has been applied to the identification of optical glasses. The fluorescence depends less on the optical type than on incidental or deliberate additions of PbO, As_2O_3, Fe_2O_3, and Sb_2O_3. Each shop can set up a standard scale for the particular brands of glass used. A dozen different flint glasses could be arranged in a series that is in fair agreement with their lead contents. Two borosilicate crown glasses could be separated because their different antimony contents led to different fluorescence. Variation in effects on antimony fluorescence could be used to separate soda-lime, barium, and borosilicate crown glasses. A.P.

Report on glass fractures. ROGER F. SCOTT. *Glass Ind.*, **26** [4] 181, 196 (1945).—Three flat, laminated, glass disks, broken by impact near the center, exhibit three distinct types of fractures: (1) the impact cone, (2) radial fractures in both upper and lower disks, and (3) spiral fractures in the impacted glass only. The first two are well known. The spiral fracture is attributed to a shift in the original compression stress on the impacted surface to tension as the glass rebounds from the impact. A.P.

Surface dealkalization of finished glassware. HELEN S. WILLIAMS AND W. A. WEYL. *Glass Ind.*, **26** [6] 275–77, 290–92, 301; [7] 324–26, 339, 341–42, 344 (1945).—A novel method for withdrawing alkali from the surface of finished glassware utilizes clay slip or other refractory materials heated in contact with the glass. The resulting "dealkalization" affects the chemical resistivity, electrical conductivity, and strength of the glass. New methods

have also been devised to permit differentiation between unaltered and dealkalized areas of a glass surface. The following factors are discussed: (1) the role of alkali in glasses, (2) migration of alkali to the surface under the influence of surface tension, (3) removal of alkali from the surface layer by chemical reactions with gases, liquids, or solids, (4) dealkalization of the glass surface by means of metakaolin, (5) methods for determining the reactivity and alkalinity of the glass surface, and (6) effect of dealkalization on the properties of glass. 29 references. A.P.

Survey of working conditions in glass industry. ANON. *Glass Ind.*, **26** [5] 225–27, 250–51 (1945).—Conducted jointly by *Glass Industry* and the Labor Relations Institute, the survey indicated that standards in the industry as a whole are high but that improvements could be made by changing or tightening of methods, rather than the investment of substantial sums in additional equipment and personnel. The questionnaire contained sixty questions covering (1) employee relations, (2) training and promotion, (3) safety and health, and (4) absenteeism and turnover. A.P.

Thatcher installs new batch plant at Olean. R. S. ARRANDALE. *Glass Ind.*, **26** [5] 229–32 (1945).—Representing a marked departure from the conventional design, a new batch plant at the Olean, N. Y., plant of the Thatcher Manufacturing Co. is a complete unit for the unloading and storage of raw materials, the crushing of cullet, and the collection, weighing, and mixing of glass batch, all housed in a single silo 31 ft. in diameter and 110 ft. high. Combined capacity of the ten bins is 1160 tons. 6 illustrations. A.P.

Thickness control of sharp cut-off type of glasses. H. P. GAGE. *Jour. Optical Soc. Amer.*, **35** [4] 276–82 (1945).—Spectrophotometric curves for the sharp cut-off type of colored glasses (yellows, oranges, and reds) have essentially the same shape for different thicknesses. To see how much the color properties can be controlled by thickness, log transmittance is plotted against wave length. It is possible to calculate the required change in thickness to produce any desired change in chromaticity within the capabilities of the glass. A.P.

Thin porous mat form Fiberglas in new uses in process, electrical fields. ANON. *Amer. Glass Rev.*, **64** [33] 14 (1945); *Science News Letter*, **47** [23] 360 (1945).—Thin porous mats of bonded glass fibers are being used in roll form for wrapping underground pipe lines to protect them against corrosion and electrolytic action. The glass serves as a carrier for an asphalt-bitumen coating. The mats are also being used as the base for a plastic laminated material which is used in radio, television, and other high-frequency devices. Advantages include low and stable loss factor, high strength, high temperature resistance, dimensional stability, and resistance to fungus attack. Another field of use for the mats is in gaskets and sheet packing. The fibers are 0.0005 in. in diameter, and the mats are 0.010 to 0.050 in. thick, 22 and 36 in. wide, and in 150- and 300-ft. rolls. Several types of binders may be used. A.P. & G.A.K.

Ultrasonic phenomena of highest frequencies in solid bodies. ADOLF SMEKAL. *Nova Acta Leopoldina*, [N.F.] **11**, 512–13 (1942); abstracted in *Chem. Zentr.*, **1944, II** [1/2] 2.—Crystals and glasses often have stresses (interior) which are limited to microscopically or submicroscopically small spaces. S. produced these stresses artificially to investigate their influence on the mechanical properties. In tensile and bending tests fractures start from a surface notch point and are propagated with high velocity into the interior of the body whereby they pass through the spot of stress and there release elastic waves. A dimension of about 1 micron of the spot and a velocity of about 5000 m./sec. of the wave in the body determine the ultrasonic frequency to about 10^{10} cycles/sec. M.HA.

Use of Fiberglas eliminates production "bug" in super gasoline process. ANON. *Amer. Glass Rev.*, **64** [34] 9 (1945).—Atlantic Refining Co. engineers have solved a production difficulty in producing 100-octane gasoline from high-sulfur-content crude by Fiberglas packs laid over the top of the catalyst to filter out iron sulfide scale and coke and carbon particles without hindering the free flow of vapor. A.P.

Use of glass in high-vacuum apparatus. R. W. DOUGLAS. *Jour. Sci. Instruments*, **22** [5] 81–87 (1945).—D. presents a summary of the more important physical properties of glass and indicates their relevance to practical problems in the design and manufacture of high-vacuum apparatus. Types of glass now used range from soft soda, hard borosilicate, lead, and extra hard glasses to special glasses. Viscosity, thermal expansion, electrical conductivity, tensile strength, Young's modulus, thermal conductivity, specific heat, density, strain and annealing, thermal endurance, evolution of gas from glass, resistance to deformation, glass-to-metal seals, and design are discussed. G.A.K.

Use of radon to trace the flow pattern of gases in furnaces. R. MAYORCAS AND M. W. THRING. *Nature*, **152** [3868] 723–24 (1943).—In the operation of furnaces, the mean mixing length, *l*, of the gases is of importance since the processes of combustion, heat transfer, and reaction with the surface being heated depend largely upon the mass transfer of gas in directions normal to the main flow. A method of calculating *l* applied to a glassmelting furnace is described: A 20-millicurie sample of radon was mixed with air in a gas holder of 350-liter capacity, and the mixture was injected at 0.15 liter/min. into the center of the main air stream of 4000 liters/min. The radon-air stream had about the same linear velocity as the main stream. Samples of the gas were drawn off through probe holes placed at various distances and positions downstream. The samples were drawn through a tower containing cotton wool and calcium chloride and passed into the chamber of an inverted emanation electroscope which was charged and evacuated several times. The top of the chamber was removed, and a small tin, with lid bored to fit over the insulator, was inserted, a fresh tin being used for each reading. Curves obtained have, for abscissa, the vertical height of the probe point in the tunnel and, for ordinate, the relative activity of the sample in scale divisions per minute. G.A.K.

PATENTS

Apparatus for burning off glassware. H. R. SCHUTZ (Owens-Illinois Glass Co.). U. S. 2,381,467, Aug. 7, 1945 (Aug. 13, 1942). 12 claims. Cl. 49-50.

Electrode arrangement for glassmelting furnaces. AKTIESELSKABET MOSS GLASSVAERK. Norw. 65,988, March 22, 1943 (Jan. 28, 1941); abstracted in *Chem. Zentr.*, **1944, II** [1/2] 62.—In continuously operated glassmelting furnaces in which the melt passes through the furnace, the individual electrodes are arranged at different heights from the bottom, which produces a better and more uniform heating of the mass than with electrodes arranged at equal height. M.HA.

Glass article and method of making. R. HADDAN (Corning Glass Works). Brit. 570,111, July 4, 1945 (July 5, 1943).

Illumination of rooms in such manner that the illumination is practically invisible from without through the windows. N.V. PHILIPS' GLOEILAMPENFABRIEKEN. Norw. 66,188, May 10, 1943 (March 6, 1940); abstracted in *Chem. Zentr.*, **1944, I** [16] 956.—The windows are painted with aniline paints of the type of Victoria green, and the room is illuminated with sodium vapor lamps which, to give a pure orange light, are provided with a screening glass containing selenium, silver, and cadmium. M.HA.

Lead oxide free glass. PATENT-TREUHAND-GES. FÜR ELEKTRISCHE GLÜHLAMPEN M.B.H. (Johann Enss and Harry Kalsing, inventors). Ger. 741,190, Nov. 6, 1943 (April 10, 1940); cl. 32*b*; abstracted in *Chem. Zentr.*, **1944, I** [16] 957.—This glass is intended to be used for making glass tubes by machine and to permit the further working by machine of the tubes into sockets and bulbs of electric incandescent lamps and discharge apparatus, characterized in that the glass consists of 57 to 65 SiO_2, 11 to 17 alkalis (of which at least half is K_2O), 8 to 15 BaO, 3 to 10 ZnO, 0.5 to 3 F, 0 to 3 CaO and/or MgO, 0 to 2 Al_2O_3, and 0 to 2% B_2O_3, whereby at least one oxide of CaO,

MgO, Al_2O_3, and B_2O_3 must be present to form glass. A glass for the sockets of electric bulbs consists, e.g., of 61.5 SiO_2, 7 Na_2O, 8 K_2O, 11 BaO, 7 ZnO, 1.3 CaO, 0.7 MgO, 0.5 Al_2O_3, 1.0 B_2O_3, and 2% F. M.HA.

Level indicator and recorder for molten glass. R. E. HOLDMAN. U. S. 2,380,436, July 31, 1945 (June 19, 1944). 3 claims. Cl. 73-290.

Manufacture of alkali silicates and glasses. DOMEC & CIE. Fr. 884,406, Aug. 12, 1943 (July 22, 1942); abstracted in *Chem. Zentr.*, **1944, I** [25/26] 1416.—Alkali silicates and glasses are made by the action of steam on silicic acid and alkali chloride in the presence of an oxygen-containing acid or its anhydride or a salt of this acid, e.g., H_2SO_4. The reactions are represented by the equations $SiO_2 + H_2SO_4 \rightarrow H_2SiO_3 + SO_2$; $SO_3 + H_2O + 2NaCl \rightarrow Na_2SO_4 + 2HCl$. When using Na_2SO_4, the following reactions take place: $SiO_2 + Na_2SO_4 \rightarrow Na_2SiO_3 + SO_3$; $SO_3 + H_2O + 2NaCl \rightarrow Na_2SO_4 + 2HCl$. A special process consists in letting steam act on a mixture of feldspar and alkali chloride in the presence of H_3BO_3 and thereby obtaining a vitreous mass. M.HA.

Manufacture of bottles of glass or ceramic material. VERRERIES POCHET ET DU COURVAL (S.A.R.L.). Belg. 448,022, July 30, 1943 (Nov. 17, 1942); abstracted in *Chem. Zentr.*, **1944, II** [1/2] 62.—Bottles that must have an absolutely definite content, e.g., for perfumes, are made by making the bottom and upper parts separately and later joining them with a binder. M.HA.

Manufacture of glass fiber rugs, etc. ALLGEMEENE KUNSTVEZEL MIJ. N. V. Belg. 449,257, Nov. 2, 1943 (Feb. 18, 1943); abstracted in *Chem. Zentr.*, **1944, I** [25/26] 1417.—The fibers are heated until they become plastic and can be bent to assume another permanent shape. The temperature is kept close to the fusion point of the glass, so that the glass fibers fuse together slightly at the points of contact. After being shaped and compressed, the fibrous material is cooled. M.HA.

Manufacture of optical glass. JENAER GLASWERK SCHOTT U. GEN. Belg. 448,072, July 30, 1943 (Nov. 20, 1942); abstracted in *Chem. Zentr.*, **1944, I** [25/26] 1416.—The glass batch contains, besides the usual constituents, thorium oxide and/or tin oxide and/or tantalum oxide. The content of four- and five-valent oxides and of SiO_2 should not exceed 20%. M.HA.

Manufacture of refractory glass. J. RIEDEL. Fr. 885,404, July 30, 1943 (Nov. 20, 1942); abstracted in *Chem. Zentr.*, **1944, I** [25/26] 1416.—The batch for this glass is made up chiefly of SiO_2 with 8 to 15 MgO, 8 (max.) alkali oxides, and up to 5% Al_2O_3 and ZnO. A suitable batch, e.g., contains 79 SiO_2, 11 MgO, 7 $(Na,K)_2O$, 2 Al_2O_3, and 2% ZnO. The thermal expansion coefficient of the glass is not more than 60×10^{-7}. The glass can also contain Sb_2O_3 and/or As_2O_3, and fluxes and coloring agents may be added. M.HA.

Manufacture of woven felts of glass fibers, together with other fibrous material of animal, vegetable, or mineral origin, such as wool, cotton, linen, asbestos, or artificial silk. SOC. ANON. FETRIMARONE. Ital. 395,823, Oct. 14, 1941 (March 2, 1937); abstracted in *Chem. Zentr.*, **1944, I** [25/26] 1417.—The fibrous material can also be impregnated with paraffin or stearin. The product is used in the pasteboard and cellulose industries and in the asbestos cement industry. M.HA.

Metallization of the glass bulbs of electron tubes. C. LORENZ A.-G. (Edmund Loepp, inventor). Ger. 745,135, Feb. 26, 1944 (Oct. 29, 1938); cl. 21*g*; abstracted in *Chem. Zentr.*, **1944, I** [25/26] 1413.—The glass bulb is coated with a metal oxide before the electrode system is built in, and the oxide coating is then converted into metal and burned into the glass during the heat-treatment required to eliminate the stresses in the glass. The coating is also, before or after burning in, subdivided by one or more slits in the longitudinal direction of the bulb. M.HA.

Method and apparatus for polishing glass, etc. J. R. TURNER, J. H. MCLEOD, AND G. H. BULLOCK (Eastman Kodak Co.). U. S. 2,380,275, July 10, 1945 (April 14, 1943). 19 claims. Cl. 51-263.

Preparation of vacuum-tight joints between glass bodies or glass masses and ceramic objects. SIEMENS & HALSKE A.-G. (Wilhelm Gebhardt, inventor). Ger. 745,060, Feb. 24, 1944 (Oct. 2, 1940); cl. 80*b*; abstracted in *Chem. Zentr.*, **1944, I** [25/26] 1417.—A vacuum-tight joint is made by heating the glass body at the point of contact to just the beginning of melting. While the objects fuse together, rapid mechanical vibrations of ultrasonic frequency are impressed upon them, e.g., by using an oscillator of the magnetostriction or quartz type. M.HA.

Providing mat surfaces upon glass. F. W. ADAMS (Pittsburgh Plate Glass Co.). U. S. 2,381,479, Aug. 7, 1945 (March 13, 1943). 2 claims. Cl. 41-42.

Treatment of the surface of glass to reduce the proportion of incident light reflected thereby. PILKINGTON BROS., LTD., AND A. R. WOOD. Brit. 569,857, June 27, 1945 (June 21, 1943).

Vacuum-tight joint between metallic and ceramic objects. PATENTVERWERTUNGS-GES.M.B.H. HERMES. Fr. 882,930, June 18, 1943 (June 6, 1942); abstracted in *Chem. Zentr.*, **1944, I** [16] 957.—The binder for the joint is a ceramic mass heated beyond its softening point which is put on the joints in ground condition and melted there. Ceramic masses used for Seger cones are preferred, but porcelain, steatite, and others are also used. M.HA.

Welding of glass with metal. S. E. M. SOC. D'ÉLECTRICITÉ ET DE MÉCHANIQUE, PROCÉDÉS THOMSON-HOUSTON, VAN DEN KERCHOVE ET CARELS S. A. Belg. 442,996, Jan. 18, 1943 (Oct. 9, 1941); abstracted in *Chem. Zentr.*, **1944, I** [25/26] 1417.—A lead-rich glass and an alloy of ferronickel with about 42% Ni is used. The glass and the metal possess almost the same thermal contraction. M.HA.

Structural Clay Products

Attempt at producing yellow brick with addition of marl. ANON. *Schweiz. Tonwaren-Ind.*, **47**, 3–5 (1944); abstracted in *Chem. Zentr.*, **1944, I** [23/24] 1316.—Experiments showed that the dolomite marl of Winterswijk, with a content of $CaCO_3 + MgCO_3$ lower than the $CaCO_3$ content of the marl of Limburg, is superior to the latter with regard to yellow coloring because of its much greater fineness. If 90% $CaCO_3$ is demanded as the minimum content of a marl, this can be considered correct only for the marl of Limburg; for other marls of much greater fineness this limiting content can be much lower, and the $MgCO_3$ content must also be taken into account. M.HA.

Dimensional coordination. M. W. ADAMS AND PRENTICE BRADLEY. *Jour. Amer. Ceram. Soc.*, **28** [8] 217–26 (1945).—1 reference, 22 figures. See "Coordination. . .," *Ceram. Abs.*, **24** [6] 107 (1945).

Freedom from fractions—discussion on dimensional coordination. FREDERICK HEATH, JR. *Jour. Amer. Ceram. Soc.*, **28** [8] 226–27 (1945).

Structural dimensional coordination. ANON. *Bull. Amer. Ceram. Soc.*, **24** [8] 315 (1945).

PATENTS

Manufacture of an addition for hardening concrete. EUGEN TRAUB. Ger. 743,888, Jan. 5, 1944 (Feb. 2, 1940); cl. 80*b*; abstracted in *Chem. Zentr.*, **1944, II** [1/2] 63.—Clay or loam consisting of natural or artificially mixed materials is melted and then broken up into suitable grains. The clays and loams used are those that are less fit for making brick because of their too low Al_2O_3 and too high Fe_2O_3, CaO, MgO, etc., contents and generally melt at temperatures higher than 1400°C. M.HA.

Refractories

Basic refractories for the copper industry: III. R. P. HEUER AND A. E. FITZGERALD. *Metals and Alloys*, **20** [1] 68–72 (1944).—In refining furnaces, the substitution of basic brick, especially the chemically bonded types, for silica or clay has greatly increased the life of the furnace, using a monolithic bottom and suspended arch roof construction. Very impure charges erode silica bottoms rapidly, whereas magnesite is little affected. In substituting magnesite for silica or clay, sufficient allowance should be made for expansion. Drips from silica roofs reacting with the magnesite walls may result in a growth of the walls due to the formation of the mineral forsterite. In roofs having a span of 25 ft., basic sprung arches are unsatisfactory even though the operation is continuous and there is little thermal shock. A sprung basic arch is difficult to repair. Where spalling conditions are severe, the use of chrome-magnesite or iron-clad magnesite in place of magnesite is recommended. In extreme cases, superduty fire clay or low porosity 70% alumina brick are used in the upper side walls of brass furnaces. For brass furnaces, nonbasic roofs are generally used, as they require less attention and their life ranges from 40 to 160 days; very long service would be required for basic brick to be economical. For Part II see *Ceram. Abs.*, **23** [10] 170 (1944). B.C.R.

New type crucible tilting furnace. ANON. *Foundry Trade Jour.*, **75** [1492] 230 (1945).—A new crucible furnace incorporates hydraulic tilting and a removable body of sturdy construction to withstand heavy foundry usage. The tilting axis passes through the spout, insuring a fixed pouring stream throughout the tilt. Oil, creosote, or gas firing may be applied, and the burner is tilted with the furnace so that it can be fired during pouring. A.J.B.

Reactions of an engineer to modern coke-oven practice. G. G. OWEN. *Gas World* [*Coking Sect.*], **33** [383] 11–24 (1945).—O. discusses seven classes of failure in a coke-oven battery, with comments on the causes and a description of the cure or repair. (1) Spalling of the end vertical flues is caused by excessive temperature gradients due to sudden heating and cooling from hot pushed coke or door removal; temporary repairs made by wet spraying, pointing, or rebricking lead to worse trouble. (2) Distortion of iron and steelwork on the coke side and, to a smaller extent, the ram side occurs in heating up, followed by creep; rebuilding and replacement of all the end flue is described in detail, together with cooling of ovens to room temperature in sequence. (3) Spalling and holing of silica walls in the body of the oven are accelerated by the high temperature generated by rich gas burning in the flue and by small producer-gas cells formed in the coal charge in the oven; they are remedied by patching with an air-coal gas spray gun, delivering a silica cement containing 2% fluxes (the mixture may later fuse at 1400°C., leaving a larger hole), by oxy-coal gas spray welding, or, ultimately, by replacement with silica blocks. (4) Overheating and collapse of regenerator arches may occur, leading to the collapse of oven soles. The oven pillar arch at sole plate level is stressed up to 30 lb./sq. in. and may be soaked up to 1400°C. Failure of this kind is rare and appears to be due to the contraction of thick mortar joints or to movement in brick masonry, allowing leakages as detailed under 3. (5) Creeping of the center of the battery toward the coke side amounted to 9 in. after 13 years. It is ascribed to the 15-ton push of the ram, acting through the coke as a frictional force, on the sole plate and walls. Adhesion is nonexistent between the surfaces of the brick and the jointing material. The buckstaves deflect also and meet the sole plate at their middle. The effect reaches a maximum at the point most remote from the end retaining walls. (6) To correct irregularity of oven tops, the top course was stripped and relaid in refractory concrete. O. gives maintenance costs for each quarter for two batteries over 13 years. Short-term plans for reducing the incidence of the above troubles include (*a*) dummy end flues of semisilica brick; (*b*) a buttress form of guide bench to bear on the center of the buckstave; (*c*) further improvement in refractory tolerances, better cements (especially one which fuses to the silica brick during heating up but does not flux the brick at working temperature), and possibly even further use of tongued and grooved joints; and (*d*) a refractory concrete oven top. As a long term policy, consideration should be given to 8-oven batteries. These small batteries would contain (1) an enshrouding shell of reinforced refractory concrete, thus eliminating buckstaves and providing a permanent top during repairs; (2) similar concrete walls to contain the ascension pipes and gas-collecting and Beimann mains; (3) a top slab cooled by air passed to the regenerator bottom flues; (4) dry quenching as a permanent extension on the coke side, eliminating machinery on that side; (5) a new type of coke-side door, sealed with a grout; and (6) measuring hoppers to replace the charging larry. 15 illustrations. L.R.B.

BOOK

Steel Plant Refractories: Testing, Research, and Development. J. H. CHESTERS. United Steel Companies, Ltd., Sheffield, 1944. Price £1 16s. Reviewed in *Refrac. Jour.*, **21** [5] 224–25 (1945); *Foundry Trade Jour.*, **75** [1493] 256 (1945). xi + 509 pp.—The importance of refractory materials must be evident, for so many industries are dependent on the effective use of furnaces. The life of an industrial furnace is usually determined by the resistance of the refractory materials to the prevailing conditions. Siemens realized the significance of this when he wrote "Every advance in the quality of refractory products has been attended by an improvement in all manufacturing processes dependent on furnace operations." Thus, refractory materials must be considered as key products, for it is impossible to conceive the modern manufacture of iron, steel, etc., without them. Further, the overall economy of practically all high-temperature operations is dependent in considerable measure on the ever-improving quality of these heat-resisting materials. C. deals authoritatively and in an original manner with refractory materials in the steel industry. The publication of this book marks an epoch in the development of the technology of refractory materials. The book may be roughly divided into two parts: one deals with the properties of various types of refractories, while the other is devoted to a consideration of the utilization of these refractories in various locations in the steelworks. After a useful introductory chapter on methods of testing, silica brick are discussed as being probably the most widely used in the industry; then follow chapters on basic refractories, including magnesite, chrome-magnesite, and dolomite. Chrome and chrome-magnesite brick are dealt with on the basis of the properties of the spinels, their lattice dimensions, and their behavior under equilibrium conditions. Firebrick find their chief use in the steel industry in the checker fillings, flues, ladles, and reheating furnaces; they are used in later stages of the steel-making process. The important field of insulating refractories, their properties and application, and methods of calculating heat flow through furnace walls are effectively considered in the last chapter of this part of the book. Refractories usage in the open-hearth furnace has been the subject of more research than has this usage in any other installation.

The subject is subdivided so that one chapter is devoted to the basic furnace above the sill plate, another to the basic furnace below the sill plate, and a third deals with the acid furnace; this differs slightly from the normal subdivision at the stage level and leads to a consideration of the furnace hearth along with the regenerators. The full chapter on the acid open-hearth furnace is especially welcome, as this type of furnace, admittedly less widely used now than formerly, has, in general, received far less attention in the literature than has the basic furnace. The final chapters of the book deal with Bessemer converters, electric furnaces, soaking pits, reheating furnaces, and the casting pit. The tables of laboratory data on casting-pit

refractories should prove useful as a basis for comparison to many steelmakers; this may also be said of the appendix on the properties of selected refractories. Other appendices give useful data of the type frequently required in the general technical control of refractories usage.

The modern basis of ceramic technology owes much to the phase rule. In the first part of the book, C. is greatly concerned to give this a prominent place in his treatment of the subject. In the refractories industry, the equilibrium diagram was first applied in the field of silica brick. The significance of the polymorphic transformations of silica was investigated by H. le Châtelier toward the close of the last century. His paper, "De l'action de la Chaleur sur le Quartz," published in 1906, is a classic in ceramic literature. It was Fenner in America, however, who put forward the silica equilibrium diagram in its present form. The Geophysical Laboratory reported its study of the pertinent system $CaO–Al_2O_3–SiO_2$ in 1915, but it was not until 1927 that Greig reported the findings which are most highly significant in understanding the melting behavior of silica refractories. The importance of Fenner's work was promptly recognized by the refractories industries in America, Germany, and this country. Comprehensive and highly influential studies of silica refractories, which shortly appeared, indicated how Fenner's conclusions should guide the manufacture and application of silica refractories. For instance, McDowell contributed to the development of a type of interpretative diagram of phase changes which has since been included in most studies on silica. McDowell not only made use of the data available in 1917, but he indicated the method wherein other data might be applied when they should become available. Similarly, Rees' work for the British Refractories Research Assn. gave technical significance to Fenner's findings. Greig's data on the equilibrium relations in the system $CaO–SiO_2$ are of considerable significance to the refractories manufacturer. His paper, "Immiscibility in Silicate Melts," published in 1927, is of unique value to the manufacturer of silica refractories. Earlier work had indicated that there was a fairly uniform but gradual decrease in the final melting temperature as increasing amounts of lime were added to silica. Greig, however, found that the final melting temperature was unchanged for all mixtures of silica and lime containing about 1 to 27.5% lime. In other words, the high-silica end of the melting curve exhibits a form which may be referred to as a plateau. This unusual phenomenon is directly related to Greig's discovery that these compositions do not melt to form the usual single homogeneous liquid; instead they form two liquids which are immiscible in each other. If the refractories manufacturer had not already been using lime as a bond, these findings would forcibly have suggested its use. The prior use of lime does not detract from the appreciation of these phase-rule data. The data provide a scientific basis for deciding the composition of suitable silica rock and the optimum amount of lime to use. C. has been particularly successful in his method of exposition. He has combined comprehensiveness with the exclusion of unnecessary detail. The book is written in an attractive style and is particularly well illustrated. It is highly recommended to all interested in refractory materials.

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Refractory members especially applicable to furnace hearths, dampers, etc. INCANDESCENT HEAT CO., LTD., J. J. HANNING, AND J. R. HOWARD. Brit. 570,113, July 4, 1945 (Aug. 14, 1943).

Manufacture of highly refractory brick. BROHLTAL A.-G. FÜR STEIN- UND TONINDUSTRIE (Hans Pohl and Heinrich Mori, inventors). Ger. 742,024, Nov. 20, 1943 (March 14, 1941); cl. 80*b;* Fr. 881,191, April 16, 1943 (April 14, 1942); abstracted in *Chem. Zentr.*, **1944, I** [25/26] 1417–18.—The brick are made of weakly fired magnesia (**I**), with additions of other highly refractory materials. The starting material is **I** or a mixture containing $\mathbf{I}_1$ which, after being fired at temperatures between 1100° and 1300°C., has the following composition as referred to the fired substance: about 66 to 85 MgO, at least 10 (max. 30) Fe_2O_3, less than 1 Al_2O_3, less than 1 SiO_2, and less than 2% CaO. It is further worked by adding, to the weakly fired, ground magnesia, organic or inorganic binders and less than 1% of a sintering material. From this mass, brick are formed under high pressure and fired at 1460° to 1540°C. Molten magnesia, sintered magnesia, corundum, chromium ore, zirconium ore, or similar materials can be added to **I**. M.HA.

Manufacture of highly refractory objects resistant to temperature fluctuations and bending. HEINRICH KOPPERS G.M.B.H. (Hubert Frank, inventor). Ger. 745,059, Feb. 24, 1944 (Dec. 2, 1941); cl. 80*b;* abstracted in *Chem. Zentr.*, **1944, II** [1/2] 63.—The objects are made of SiC- and Al_2O_3-containing masses. Coarse firebrick mass is embedded in a binder of fine-grained SiC and Al_2O_3 with a little clay, and the whole is then formed, dried, and fired. The total SiC and Al_2O_3 content should amount to about 40%, the Al_2O_3 being at least equal to the SiC; the latter should be at least 5% of the whole mass. M.HA.

Manufacture of mixed cements of lime-containing binders and Al silicates. WOLF STRÄTLING AND HANS ERNST SCHWIETE. Ger. 744,064, Jan. 13, 1944 (July 25, 1937); abstracted in *Chem. Zentr.*, **1944, I** [25/26] 1418.—The aluminum silicates should be added in the form of a mixture of high- and low-fired Al silicates. Such mixed cement is composed, e.g., of 70 Portland cement, 10 kaolin fired to 600°C., and 20% kaolin heated to 1000°C. M.HA.

Manufacture of products of high alumina content. HEINRICH KOPPERS G.M.B.H. (Elisabeth Lux, inventor). Ger. 741,773, Nov. 17, 1943 (July 23, 1938); cl. 80*b;* abstracted in *Chem. Zentr.*, **1944, II** [1/2] 63.—Such products, e.g., mullite, are made by starting with an alumina hydrate in a very fine crystalline, difficultly filtrable, and washable form (as obtained by the Bayer process). The alumina hydrate may contain about 1% alkali-containing water-soluble impurities and is applied in a moist, unground or in a dried or calcined, slightly ground form. M.HA.

Production of alumina. J. H. WALTHALL (Tennessee Valley Authority). U. S. 2,381,477, Aug. 7, 1945 (May 21, 1942). 5 claims. Cl. 23-141.—1. A cyclic process for the production of alumina from siliceous aluminiferous material which comprises intimately mixing a stream of dehydrated siliceous aluminiferous material and a stream of aqueous sulfuric acid derived at least in part from operation of the process defined herein, and containing a small proportion of aluminum sulfate, at a temperature and for a time sufficient to extract substantially all of the aluminum from the material and form a mixture of the dissolved aluminum sulfate substantially free from dissolved silica and a siliceous residue, separating the impure aluminum sulfate solution so formed from the siliceous residue, adding to the impure aluminum sulfate solution a sufficient quantity of manganous acid to precipitate the iron therein as an iron-manganese complex, separating the aluminum sulfate solution so purified from the iron-manganese complex, washing the iron-manganese complex with water to produce a more dilute aqueous solution of aluminum sulfate substantially free from iron, dehydrating and desulfurizing the purified aluminum sulfate solution to produce alumina and oxides of sulfur, and oxidizing and absorbing the oxides of sulfur in the more dilute aluminum sulfate solution produced in operation of the process defined herein to produce sulfuric acid containing a small proportion of aluminum sulfate.

Treating magnesian ores and minerals. G. C. HOLMES. U. S. 2,381,053, Aug. 7, 1945 (April 4, 1942). 2 claims. Cl. 23-201.

Whiteware

Use of polyvinyl alcohol in ceramics. LESLIE BROWN AND LEON COFFIN. *Ceram. Ind.*, **44** [5] 126–30 (1945).—An intensive investigation of natural and synthetic resins as temporary ceramic binders led to the use of water-soluble polyvinyl alcohol to improve the working properties of ceramic bodies. As there are a number of polyvinyl alcohol resins of varying water solubility, all available grades were examined. It was found that completely hydrolyzed, low-viscosity polyvinyl alcohol, supplied by Du Pont Co. as grade RH-393, was found best for improving jigger slip porcelain bodies. In steatite compositions, partially hydrolyzed grade RH-623 appeared to be an ideal temporary binder. No migration of the binder to the surface of extruded ware can be found. The material is also suggested as an addition to glaze and color compositions. 1 illustration. H.T.

PATENTS

Ceramic bodies. I. E. SPROAT (R. T. Vanderbilt Co., Inc.). U. S. 2,380,198, July 10, 1945 (Nov. 2, 1943). 4 claims. Cl. 106-62.—3. A mixture of comminuted brucite and comminuted pyrophyllite in a ratio ranging from 1:4 to 3:2, the pyrophyllite containing a small amount of sericite.

Dinnerware lining machine. W. H. EMERSON (Homer Laughlin China Co.). U. S. 2,380,509, July 31, 1945 (April 3, 1943). 34 claims. Cl. 91-12.

Spark plug. CHESTER CIPRIANI. U. S. 2,380,579, July 31, 1945 (June 16, 1942). 14 claims. Cl. 123-169.

Equipment and Apparatus

Attachment to minimize the effects of thermal lag in furnace control. K. HOSELITZ. *Jour. Sci. Instruments*, **22** [5] 96 (1945).—With control of the power input by a frequent make and break of the relay, superimposed onto the actual controlling conditions of the thermoregulator, satisfactory close control can be achieved without unnecessary dissipation of energy for big or small furnaces. H. describes a device that operates satisfactorily even when no great care is taken to place the platinum thermometer in the optimum position. The closeness of control achieved is almost independent of the heat capacity of the furnace, since the frequency of make and break can be adjusted to suit any particular furnace. G.A.K.

Calibration and characteristics of a sensitive hot-wire anemometer. T. A. STEEVES, A. E. CHADDERTON, AND W. H. COOK. *Can. Jour. Research*, **23** [3] F192–97 (1945).—A wet test meter was used to measure the air supplied to a small wind tunnel that could be adjusted to provide up, down, or side drafts for the calibration of a sensitive hot-wire anemometer. The readings on the instrument used were independent of the direction of air flow and the orientation of the instrument at velocities in excess of 10 ft./min. At lower velocities, separate curves were obtained from different instrument orientations and directions of air movement. Air flows as low as 1 ft./min. can be estimated with useful accuracy provided the direction of air movement is known. G.A.K.

Direct reading instrument for spectrochemical analysis. M. F. HASLER AND H. W. DIETERT. *Jour. Optical Soc. Amer.*, **34** [12] 751–58 (1944).—An instrument which gives direct, accurate, quantitative analyses of all elements to be measured promises advantages in speedier and more economical analyses, but practical limitations prevent achievement of this objective merely by the attachment of a few gadgets on present spectrographic equipment. Only by designing an entirely new spectrum-dispersing instrument can direct reading be made sufficiently flexible. After consideration of instrumental details, analytical procedures, probable speed and accuracy, present limitations, and future developments, a proposed instrument is announced. It will be most useful in routine analyses on the same type of unknown. A.P.

Finish gauge—latest contribution to glass container quality control. ANON. *Glass Ind.*, **26** [7] 327, 346–47 (1945).—The Hartford-Empire Co. has developed a finish diameter indicating comparator intended for production control of the sealing surfaces of glass containers designed for vacuum sealing. Manually operated, the model can determine adjustments to prevent such defects as offsets, excessive out-of-roundness, indentations, bulges, flats, and oversize or undersize diameters. Gauges for several types of glass finishes and a range of 16 sizes will be made available for food containers. A one-piece cast-aluminum housing protects the indicator and hardened working parts, which are two ball-point contacts set to measure the practical vertical center of the gasket sealing surface. Side points serve as centering guides and as a fixed maximum diameter gauge. Standard tolerances are built into the gauge by calibration against a master gauge which accompanies each working gauge. A.P.

Gyratory sieving and straining machines. ANON. *Ind. Diamond Rev.*, **5** [57] 185 (1945).—A laboratory sieving and straining unit and a diamond powder wet-sieving unit are manufactured by Russell Constructions, Ltd., according to Brit. Pats. 525,253 and 562,210. The sieves are caused to execute a controlled gyratory motion of small amplitude, imparting to each particle a dual motion comprised of both rolling and translatory components. The machine is driven by a fractional horsepower electric motor. 2 illustrations. P.G.

Instruments for measuring and controlling process variables. ANON. *Chem. & Met. Eng.*, **50** [5] 108–24 (1943).—A review of all types of instruments suitable for this purpose. B.C.R.

Microscopy with light, electrons, and X-rays. G. D. PRESTON. *Jour. Sci. Instruments*, **21** [12] 205–13 (1944).—P. describes in general terms the relation between light, X-ray, and electron microscopy so that the methods can be compared and differences and advantages of one over another can be noted. The limitation of the optical microscope is discussed. The lower limit for detecting small objects is not much beyond 0.1 μ due to the difficulty of getting very small particles to scatter enough light to make their presence visible. The limit of useful magnification is 650. The theory of the electron microscope is presented under the following headings: (1) electrons, (2) electrostatic lenses, (3) magnetic lenses, and (4) electron microscope. The theory and applications of X rays are covered. Illustrated. G.A.K.

New data on activated bauxite desiccants. R. G. CAPELL, R. C. AMERO, AND J. W. MOORE. *Chem. & Met. Eng.*, **50** [7] 107–10 (1943).—Adaptable to all processes involving the use of granular drying agents, Florite, a new activated bauxite desiccant, offers some advantages over the older types, viz., equal or superior drying efficiency and overall performance and greater economy because of lower cost and longer life. Applications to the drying of organic liquids and gases are described. B.C.R.

New form of photoelectric ultraviolet spectrophotometer. D. L. DRABKIN. *Jour. Optical Soc. Amer.*, **35** [2] 163–69 (1945).—D. describes a spectrophotometer for objective photoelectric measurements in the ultraviolet that has several novel design features allowing flexibility of application and stability of performance. A.P.

Optics in industry. ANON. *Optician*, **109** [2822] 212 (1945).—The war has entailed the development of more rigid systems of inspection of finished products. Optical apparatus applied include (1) projectors for contour comparisons, (2) flats for checking flatness, concentricity, and dimensions; (3) dividing heads for increasing the accuracy of gauge, screw, and gear manufacture; (4) X rays; and (5) black light for detecting minute cracks and pores. A.P.

Photometer for luminescent materials. RAY P. TEELE.

Jour. Optical Soc. Amer., **35** [6] 373–78 (1945).—In evaluating luminescent materials it is necessary to take into account the behavior of the human eye at low values of luminance. A photometer developed at the National Bureau of Standards properly provides for the determination of luminances. It has been used for three years in routine measurements of the brightness-decay curve of phosphorescent materials and to determine both luminance and chromaticity of the fluorescent light from papers impregnated or coated with fluorescent chemicals. A.P.

Principles of microscope illumination and the problem of glare. W. T. DEMPSTER. *Jour. Optical Soc. Amer.*, **34** [12] 695–710 (1944).—The manipulations in using the microscope, other than selection of lenses, focusing, and placement of slides, relate to the illumination. When the illumination is not handled with judgment, glare and lack of contrast result. Effective "controlled" illuminations depend upon the condenser, the field stop, and the illuminant proper. A.P.

Radiating characteristics of tungsten and tungsten lamps. W. E. FORSYTHE AND E. Q. ADAMS. *Jour. Optical Soc. Amer.*, **35** [2] 108–13 (1945).—Spectral emissivities for tungsten for constant temperatures of 300°, 2000°, and 3000°K. are plotted against wave length between 0.2 and 4 μ. Emissivities for a number of temperatures and wave lengths read from the curves are given in a table. Because the spectral distribution from the filament of a tungsten lamp is different from that of tungsten, lamp data are obtained by direct measurements. Operating characteristics and spectral radiant intensities for nine representative lamps are given in tables. By interpolation, the spectral radiant intensity can be derived for any lamp of these general types whose color temperature and candle power are known. Spectral data on six special lamps are also given. A.P.

Techniques in applied electron microscopy. R. D. HEIDENREICH. *Jour. Optical Soc. Amer.*, **35** [2] 139–48 (1945).—Silica replicas of surfaces are useful for studies of grinding and polishing. Stereomicrographs are useful for observing elevation changes. 17 photographs. See "Fine. . .," *Ceram. Abs.*, **22** [6] 104 (1943). A.P.

Use of Columbia Resin No. 39 as an optical cement. H. W. COLES, HARRY DEUBERRY, AND F. P. CURRY. *Jour. Optical Soc. Amer.*, **34** [10] 623–25 (1944).—Exposure of optical equipment to very low temperatures has made urgent the development of a substitute for Canada balsam that would absorb sudden temperature changes and the differential contraction of large lenses at −20°C. or less. Columbia Resin CR-39 has been found satisfactory for small and large lenses and prisms. A.P.

Visual factors in microscopy. W. T. DEMPSTER. *Jour. Optical Soc. Amer.*, **34** [12] 711–17 (1944).—In work with the microscope, maximum returns in the way of crisp imagery, in detail, and in visual comfort are obtained only when the conditions of illumination are carefully adjusted. Special conditions beyond those basic to photomicrography are necessary for high visual efficiency. Conditions for high visual acuity and comfort are considered. A.P.

X-ray powder diffraction camera. J. SHEARER. *Jour. Sci. Instruments*, **21** [11] 198–200 (1944).—An X-ray powder camera is described which is designed for speed of working. This is achieved (at the cost of certain disadvantages) by improving factors that control exposure time and by eliminating the necessity of any adjustments and any calibration where these have once and for all been carried out. The camera is applicable to the analysis of soil colloids. G.A.K.

PATENTS

Electrical dust-precipitator system and interchangeable parts therefor. E. H. R. PEGG AND I. R. CUMMINGS (Westinghouse Electric Corp.). U. S. 2,380,992, Aug. 7, 1945 (Oct. 8, 1943). 21 claims. Cl. 183-7.

Kilns, Furnaces, Fuels, and Combustion

Application of radiant and inductive heating to industrial processes. L. J. C. CONNELL. *G. E. C. Jour.*, **13** [1] 10–32 (1944).—C. describes three new methods of applying heat: (1) radiation from, e.g., banks of electric lamps or resistors, (2) capacity-current heating, and (3) eddy-current heating. An introductory theory of the application of radiation and convection heating, e.g., to an ordinary convection oven, is given. The reflectors for method 1 should be surfaced with gold, rhodium, or anodized aluminum. The speed of heating by this method and its suitability to flow production are demonstrated. Many applications are described, including the drying of foundry molds. Capacity-current heating is the name given to the heating of a dielectric placed between condenser plates connected to a source of h.-f. current. The rise of temperature of the dielectric is rapid and uniform at all points, if heat loss from the periphery is prevented. It is suitable for materials of low conductivity, such as wood, plastics, and textiles. The necessary equipment is similar to a radio transmitting set. For the third method, frequencies from below 15,000 to about 1 million cycles per sec. are generated by a rotary generator or vacuum-tube oscillator. The metallic object is placed inside a coil through which the h.-f. current is passing and is heated within its skin by eddy currents. Hardening is the chief application at present. L.R.B.

Flow states in emergent gas streams. J. E. GARSIDE, A. R. HALL, AND D. T. A. TOWNEND. *Nature*, **152** [3869] 748 (1943).—Photographs are shown taken at intervals of $^1/_{50}$ sec. after releasing propane abruptly from its confinement through a 0.75-in. diameter tube 40 in. in length, the velocity of the stream increasing from zero to that adequate for turbulence. The first two figures indicate the primary vortex conditioned by the initial expansion of propane into the surrounding atmosphere, followed at successive intervals by secondary vortices. The third figure indicates a transition flow state before the attainment of velocities adequate to induce turbulence indicated in the fourth figure. The secondary vortices are the most likely source of the periodic expansions and contractions of the outer cone of a Bunsen flame. When a nonaerated flame at an adequate feed velocity leaves a burner port but remains stationary some distance above, it appears to be sealed at the locus of rapid development of the secondary vortices. G.A.K.

Glost firing of ware. ANON. *Ceram. Ind.*, **44** [5] 132–34 (1945).—Ceramic practice in the glost firing of vitrified and semivitreous ware is described. H.T.

High-frequency heating. R. R. BAKER AND C. J. MADSEN. *Paper Trade Jour.*, **119** [8] 25–30 (1944).—Inductive and dielectric heating are defined, and a short discussion of the inductive process is presented. The principles of dielectric heating are discussed, and the basic equations for the determination of the varied factors required for a particular application are given. The loss factors and specific heat were tested for a number of materials. Spacing of electrodes is considered. The use of dielectric heating is explained, with examples, indicating the possibilities and limitations in heating paper and paperboard. W.R.B.

Suitability of wartime coals for use in gas producers. W. D. VINT. *Metallurgia*, **29**, 152–54 (1944).—During the war, a greater amount of sands and fines has been observed in coal for use in gas producers. Sand causes the greatest amount of trouble because it results in the formation of a low-fusible clinker, coating the interior of the producer with glassy silicates; it is worth while, therefore, to separate the sand from the coal. Fines also cause trouble, and the saving in fuel and the increased efficiency of the gas producer are worth the extra labor involved in separating them. E.C.P.

Test data on a multitubular-type gas-fired infrared oven. W. A. FITZSIMMONS. *Gas World* [*Ind. Gas Supp.*], **18** [4] 5–8 (1945). L.R.B.

Thermal lag in heat-treatment operations. A. E.

PEARCE. *Foundry Trade Jour.*, **76** [1501] 67–72 (1945).—P. reviews heat transfer by conduction, radiation, and convection, together with the heat capacity of various materials. Examples are given of the effect of thermal lag on the annealing of iron castings. The influence of the shape and size of pots and of the type of furnace is discussed. The design of burners, ports, and flues is important in the distribution of the flame around the work and to the walls and arch of the furnace for radiating heat. Suggestions for the loading of bogie furnaces are given, and the possibilities of induction heating are discussed. 9 references, 7 illustrations. A.J.B.

Geology

Beneficiation of South Carolina sillimanite schists. CARL RAMPACEK, B. H. CLEMMONS, AND J. BRUCE CLEMMER. *Jour. Amer. Ceram. Soc.*, **28** [8] 197–205 (1945).—3 references, 4 figures.

British fluorspar producers. ANON. *Foundry Trade Jour.*, **76** [1498] 10 (1945).—A brief account is given of the marketing anticipations of fluorspar producers and of the necessity for research. See *Ceram. Abs.*, **23** [6] 110 (1944); **24** [1] 20–21 (1945). A.J.B.

Colored haloes surrounding inclusions of monazite in quartz. G. G. LAEMMLEIN. *Nature*, **155** [3946] 724–25 (1945).—Quartz crystals with zonal color from the Transbaikal region were found with inclusions of monazite crystals around which the quartz was of an intense smoky color. Calculations have shown that halos of such dimensions could be produced by the action on quartz of hard β rays spreading from the monazite and presumably emanating from disintegration products of thorium contained in monazite. With geological aging, the boundaries of the halo gradually extend. G.A.K.

Fluorspar mines of Ontario. R. C. ROWE. *Can. Mining Jour.*, **66** [7] 461–64 (1945).—Fluorspar occurs in association with barite and/or calcite in the Madoc district and has been mined sporadically since 1905. Production figures for World War II cannot as yet be made public. The mineral occurs in veins in post-Ordovician fault fissures in granites and limestone. It exists in the form of alternating bands or as a network forming the partitions between caverns. A small amount of secondary alteration consists of the leaching out of calcite, leaving the fluorspar as a gravel. G.M.H.

Importance of alkali hydroxides for the migration of bitumen in rocks. Origin of certain discolorations of natural stones in brickwork. G. FREEBOLD. *Oel u. Kohle*, **39**, 783–85 (1943); abstracted in *Chem. Zentr.*, **1944, II** [1/2] 62.—Bituminous substance in the rock is dissolved by alkali hydroxide solutions present and migrates. If hydroxides are converted to carbonates, the bitumen is precipitated again and discolors the light parts of the rock. The discolorations of sandstone near the joints, which occur after 2 to 4 months, can be attributed to the bitumen of the coat of insulating paint. M.HA.

Jusite, a probable new mineral. ILSE GRAMLING-MENDE AND GUSTAV LEOPOLD. *Neues Jahrb. Mineral. Geol. Monatshefte*, **1943A**, pp. 178–84; abstracted in *Mineralog. Abs.*, **9** [3] 37 (1944); *Chem. Zentr.*, **1944, II** [1/2] 10.—A white, fibrous, probably orthorhombic mineral has been found in a melilite dike at Jus, Würtemberg, with the following analysis: SiO_2 40.38, Al_2O_3 8.23, CaO 35.12, Na_2O 1.14, K_2O 2.47, and $H_2O + CO_2$ 12.80%; 8.31% water was lost at 230°C. and the remainder at a red heat. Specific gravity is 2.32. Spacing along the needle axis is 3.69 a.u. The mineral differs from pectolite, thaumasite, ptilolite, mesite, riversideite, radiophyllite, yuksporite, and the zeolites. L.R.B. & M.HA.

New facts regarding Oklahoma raw materials for the ceramic industries. A. L. BURWELL AND W. E. HAM. *Bull. Amer. Ceram. Soc.*, **24** [8] 293–95 (1945).—3 references, 1 figure.

Nonmetallic minerals, a rapidly expanding field. A. F. GREAVES-WALKER. *Foote Prints*, **17** [1] 10–19 (1945).—Nonmetals are divided into five classes: (1) abundant—wide usage, (2) abundant—limited use, (3) limited quantities—considerable usage, (4) limited quantities—limited use, and (5) abundant—awaiting use. Present and potential applications are discussed for eighty-six minerals. A.P.

Physical and geometrical axes of reference for quartz. AUSTIN F. ROGERS. *Amer. Jour. Sci.*, **243** [7] 384–92 (1945). B.C.R.

Rugosity of granular solids. R. H. S. ROBERTSON AND B. S. EMODI. *Nature*, **152** [3862] 539–40 (1943).—A method for determining the coefficient of roughness and angularity, or "rugosity," of individual grains is described. Coefficients of rugosity are likely to be valuable in the study of the flow properties of dry powders and of the rheological properties of insoluble powder–liquid systems. It is a useful measurement for evaluating substances which are required to have a high specific surface combined with a high permeability to fluids, such as fuller's earth and base-exchange materials. The method can probably be used for estimating the degree of aggregation of particles the separate particle size of which can be otherwise determined. G.A.K.

Shear modes in nonpiezoelectric crystal plates. S. BHAGAVANTAM AND J. BHIMASENACHAR. *Nature*, **156** [3949] 23 (1945).—Further work on the determination of the elastic constants of crystals, utilizing ultrasonic waves, has revealed that shear modes can also be transmitted through crystal plates and communicated to liquids in the form of consequential longitudinal strains. Associating such transmission maxima with thickness transverse frequencies, torsion constants for crystal plates can be calculated and the full set of elastic constants obtained by purely dynamic methods. G.A.K.

Significance of pH in the control of the properties of clay. R. E. GRIM. *Illinois State Geol. Survey Bull.*, No. 68, pp. 268–72 (1944).—G. analyzes briefly the influence of the kind and amount of electrolyte on the properties of clay in the plastic state. If clays of the same water content are compared, the Na^+ clay will be less stiff and yield with lower applied pressure than the H^+ clay. Na^+ clays have high, Ca^{++} clays intermediate, and H^+ clays low transverse strengths in the dried condition. Some data suggest that the substitution of Na^+ for H^+ tends to increase linear shrinkage and that exchangeable Fe^{+++}, Al^{+++}, and Ti^{+++} tend to reduce it. Other investigations show that certain Na^+ and H^+ clays have about the same amount of shrinkage, in each case lower than Ca^{++} clay. Na^+ clays absorb more water at a slower rate than Ca^{++} clays. The important fact brought out by the foregoing data is that Na^+ and H^+ tend to change the properties of clay in opposite directions. G. concludes that it is not yet possible to predict with much accuracy the exact influence of a given electrolyte on the properties of any clay. If the composition of a clay is known and Na^+ or H^+ is used for treating, a good guess can be made as to what the results will be. G.A.K.

Three roofing granule plants in Pennsylvania. RICHARD M. FOOSE. *Amer. Inst. Mining Met. Engrs. Tech. Pub.*, No. 1787; *Mining Tech.*, **9** [1] 7 pp. (1945).—Three plants produce most of the roofing granules in Pennsylvania; their production totalled 100,000 tons in 1943. The Funkhouser Co., near Delta, York County, has quarries in the Peach Bottom slate. Jackhammers are used for drilling; after blasting, electric shovels load the trucks. Primary crushing is done by a gyratory, while a hammer mill does the secondary; the product is dried and goes through other hammer mills, screens, and rolls. The finished granule is minus 8-mesh, plus 35-mesh; the fines are used as asphalt filler. A large dust-collecting system is used. The Advance Industrial Supply Co., at Gladhill Station, Adams County, has quarries in greenstone and a purple rhyolite. Jackhammers are used, and the rock is

hand-loaded to mine cars pulled by a gasoline engine. It goes through three gyratories, screens, rolls, and more screens; the final product is minus 9-mesh, plus 34-mesh. The fines are wasted; the men must wear respirators. The Funkhouser Co., at Charmian, Adams County, colors artificially about 5% of its product. It operates a mine in greenstone and a quarry in quartzite. The greenstone is loaded into skips; two gyratory crushers and one cone crusher are used, followed by a screen, a drier, rolls, and more screens. The finished product is minus 10-mesh, plus 35-mesh. Granules to be colored are treated with the desired pigment and fired in a rotary kiln at 1300°F. The greenstone makes green or blue colors, while the quartzite is colored red, white, buff, and brown. 3 figures. W.D.F.

SEPARATE PUBLICATIONS

Geology of Quebec: Vol. II. Edited by JOHN A. DRESSER AND T. C. DENIS. *Dept. of Mines, Quebec, Geol. Rept.*, **20**; reviewed in *Can. Mining Jour.*, **66** [7] 479–80 (1945). For Vol. **I** see *Ceram. Abs.*, **21** [11] 246 (1942). G.M.H.

Sillimanite and Massive Kyanite in Georgia (Preliminary Report). A. S. FURCRON AND KEFTON H. TEAGUE (with discussion of concentration by J. Bruce Clemmer, Carl Rampacek,and B. H. Clemmons, and refractory properties by T. N. McVay). *Georgia Geol. Survey Bull.*, No. 51, 76 pp. (1945). 19 illustrations, 3 maps.—The report discusses deposits of sillimanite and massive kyanite in Georgia. Part I describes sillimanite deposits recently discovered in Hart, Elbert, and Madison Counties, Ga., and from Towns County, Ga., and Clay County, N. C. The report also covers the geology, classification, distribution, uses, and other economic features of the mineral. Large samples from the deposits in Hart, Elbert, and Madison Counties were referred to the Southern Experiment Station, Department of Interior, U. S. Bureau of Mines, where sillimanite concentrates were prepared; tests for refractory values were conducted at the Electrotechnical Laboratory of the Bureau of Mines at Norris, Tenn. Preliminary concentration indicated that this sillimanite ore is amenable to flotation. Chemical and screen analyses of the Georgia and South Carolina sillimanite indicate that the ores from the two states are very similar. Firing tests showed that refractories made of sillimanite meet both the reheat specifications of the American Society for Testing Materials and those of the U. S. Navy for superduty refractories. In high-temperature load tests, sillimanite brick have an excellent load-carrying capacity at elevated temperatures and in the alumina-silica class are probably exceeded only by the electrocast corundum mullite. Part II deals with deposits of massive kyanite recently discovered in Cherokee, Pickens, Dawson, and Gilmer Counties. This section of the report does not duplicate data published in *Bull.* No. 46 (*Ceram. Abs.*, **14** [7] 172 (1935)). Under the discussion of massive kyanite, the report describes briefly the occurrence of ore similar to that now imported into this country from India. Deposits of kyanite are classified, and the size, distribution, origin, and geology of deposits of the massive type in this part of the State are discussed. Samples of the kyanite ore were sent to the Electrotechnical Laboratory, Norris, Tenn., where brick samples were made and given the preliminary standard tests for refractories. In general, satisfactory superduty refractories were made from the Georgia massive kyanite samples. Mineral stains and inclusions in the massive kyanite cause 10 to 33% loss during calcination. This loss is more pronounced in the smaller lumps. A coarse, compact, and sturdy grog was obtained from the Georgia mineral, and this was similar to that furnished by the fibrous and coarse crystalline grades of India kyanite but not equal to the best India corundum kyanite. Grog of the Georgia massive quality has never been obtained from other domestic kyanite by direct calcination of original lumps. A coarse grog is desirable for quality of ware and ease of manufacturing and in the production of spall-resistant refractories. Standard-size brick made from the Georgia kyanite were lighter in weight and higher in pore space than those made from the India corundum kyanite. The sample brick when fired to 1600°C. met the A.S.T.M. reheat specifications for superduty firebrick, and it is possible that they can be made sufficiently volume constant to meet the Navy specifications. The longer firing period in commercial kilns may permit a temperature lower than the 1600°C. used in laboratory practice. The load resistance of the Georgia kyanite sample brick at high temperature was very satisfactory. 29 references.

PATENTS

Reducing barite in fluorspar concentrate. W. E. DUNCAN (Mahoning Mining Co.). U. S. 2,381,120, Aug. 7, 1945 (Dec. 24, 1943). 5 claims. Cl. 209-167.—1. The method of reducing residual barite in fluorspar concentrates derived from ores containing barite in excess of about 2%, which comprises pulping the ground ore with water, floating the pulp in the presence of sodium oleyl sulfate, collecting the barite concentrates resulting from the flotation, and subjecting the flotation tailings to agitation in the presence of a soap forming higher fatty acid and quebracho extract to thereby concentrate the fluorspar and induce a further separation therefrom of residual barite in the tailings.

Chemistry and Physics

Determination of lead as molybdate. H. HOLNESS. *Analyst*, **69** [818] 145–47 (1944).—Solutions of lead as nitrate can be determined by direct titration with a solution of 0.1 *M* magnesium molybdate using a 0.2% aqueous solution of Solo chrome red B as an indicator. The end point is sharp, reversible, unaffected by temperature, and sensitive in a solution of 0.005 *M*. The reaction is stoichiometric provided the acidity falls within a pH range of 2 to 5.5 and few foreign ions are present. The method can be applied to the determination of lead in lead-tin alloys. Erratic results were obtained in the presence of antimony. Data given showed an error of ±0.2% in the pH range of 2.2 to 3.85. B.C.R.

Determination and separation of Bi and Mg using 8-hydroxyquinoline. H. G. HAYNES. *Analyst*, **70** [829] 129–31 (1945).—Bismuth is precipitated with oxine within the pH range 5.2 to 5.4 using a strong acetate buffer. Mg is determined in the filtrate. B.C.R.

Electrooptical properties of colloids: II. B. W. SAKMANN. *Jour. Optical Soc. Amer.*, **35** [1] 66–86 (1945).—In an investigation of the electric birefringence of colloidal solutions in alternating fields, the most detailed measurements were carried out with monodisperse Wyoming bentonite sols. The double refraction consists of a direct and an alternating part, both dependent on field strength and frequency of the applied field, particle size, temperature, and concentration of the solution. The measurements are interpreted by a relaxation theory which satisfactorily explains all phenomena connected with the vibrating component. The changes and reversal of sign of the direct component with concentration are explained by the assumption that the micelles are surrounded by a compressed water hull. The pressure of the hull depends on particle size and concentration. For Part **I** see *Ceram. Abs.*, **21** [10] 223 (1942). A.P.

Graphical correlation of transmittances and thicknesses in optical filters. JOHN H. MCLEOD. *Jour. Optical Soc. Amer.*, **35** [2] 185–86 (1945).—A set of curves shows the relationship between thickness and percentage transmittance for glass color filters. H. EUGENE POWELL. *Ibid.*, [6] 428.—A more convenient form of graph has already been suggested by Donald E. Sharp (see "Spectral . . .," *Ceram. Abs.*, **22** [1] 7 (1943)). A.P.

Method for determining chromaticity of fluorescent

material. W. H. BYLER AND C. C. CARROLL. *Jour. Optical Soc. Amer.*, **35** [4] 258–60 (1945).—With materials of low luminance, a special method is needed for measuring the color. A photographic method is described in which film density is converted to relative energy so that spectral energy distribution curves for unknown fluorescent colors can be readily derived from their spectrograms. The chromaticities of a large number of zinc and zinc-cadmium sulfides have been determined by this method. A.P.

Method of growing oriented sections of certain optical crystals. C. D. WEST. *Jour. Optical Soc. Amer.*, **35** [1] 26–31 (1945).—Crystal sections normal to a threefold axis are grown from melts of sodium nitrate and of certain alkali halides, such as KBr and KI, by starting crystallization at a mica cleavage surface and allowing it to proceed along the normal. The mica acts as an insoluble, infusible seed for the new crystal growth because the cleavage surface adsorbs from the melt a hexagonal net of alkali ions whose side is 5.17 a.u. which constitutes the first layer of the new crystal growth. Structures, thermal properties, and experimental techniques are discussed. A.P.

Multiple adsorption from solutions. J. E. WALTER. *Jour. Chem. Phys.*, **13** [6] 229–34 (1945).—The general theory of the adsorption of solutes from solutions which are treated by a process similar to that employed in chromatography is presented. By assuming a chemical equilibrium between adsorbed material and the solution, the adsorption equations can be solved explicitly. A detailed discussion of the two-component problem is given; the many-component problem and the extension of the theory to more general adsorption isotherms are considered briefly. G.A.K.

New procedure for evaluating the opacifying properties of pigments. A. P. ADRIAN. *Paper Trade Jour.*, **119** [15] 35–41 (1944).—A method of evaluating the opacifying power of a pigment has been demonstrated to give reproducible results in regard to specific scattering coefficient and specific absorption coefficient. It is suitable for measuring the influence of compacting pigment particles, particle size, and admixtures with other materials on the light-scattering properties of pigment films. W.R.B.

Photographic Fourier synthesis. M. L. HUGGINS. *Nature*, **155** [3923] 18–19 (1945).—In making an electron density projection, the desired summation is $\sum_{hk} F_{hk0} \cos 2\pi(hx + ky)$, where x and y are coordinates in the projected unit cell. To aid in the synthesis of density projections, an improved set of masks has recently been made on a roll of 35-mm. film. If the distribution of light through each mask is $l + \cos 2\pi(hx + ky)$, the total light intensity reaching the photographic emulsion is the desired summation plus a uniform, unwanted background. The effect of this background illumination can be nearly eliminated by using a photographic material with a suitable characteristic curve. G.A.K.

Physics and the analyst. R. C. CHIRNSIDE. *Analyst*, **70** [829] 110–18 (1945).—The need for rapid determinations of chemical constituents has led to the use of physical methods. The future analyst needs a knowledge of optics, electricity, etc., in addition to his chemical training. B.C.R.

Precipitation of tungsten with tannin. D. A. LAMBIE. *Analyst*, **70** [829] 124–28 (1945).—Phenazone (antipyrine) may be satisfactorily substituted for cinchonine in the Schoeller and Johns tannin-cinchonine method. Quantitative recoveries of W from solutions containing NH_4 salts, H_2SO_4, and alkali sulfates and phosphates is possible. Organic acids, except in small amounts, and molybdic acid should be absent. Moser and Blaustein's phenazone method has been shown to be unreliable. For small amounts of tungsten (0.1 gm.) rhodamine B may be used as a substitute for cinchonine provided that a much larger addition of the dye is used than proposed by Bex. B.C.R.

Quantitative data and methods for colorimetry. Report of Committee on Colorimetry, Chapter VII. *Jour. Optical Soc. Amer.*, **34** [11] 633–88 (1944).—Preliminary physical specifications of radiant energy, psychophysical data specifying quantitative relations between radiant energy and human visual sensations, and methods of applying these data in the solution of specific problems are presented. The immediate results of such evaluations are tristimulus values, but another form of color specification is more directly correlated with the attributes of color sensation. This specification derived from tristimulus values consists of dominant wave length, purity, and luminanse, corresponding in a general way to the hue, saturation, and brightness attributes of color sensation. The chromaticity diagram used for calculating has properties that make it useful for representing interrelations between groups of colors. Location in the diagram is a useful specification of chromaticity, equivalent in some senses to specification of dominant wave length and purity. Certain psychophysical data supplement the standard methods and results of colorimetry. 60 references. For Chapters II, V, VI see *Ceram. Abs.*, **23** [10] 164, 165 (1944); for Chapter VIII see this issue, p. 158. A.P.

Silica in natural waters. CHALMER J. ROY. *Amer. Jour. Sci.*, **243** [7] 393–403 (1945).—Contrary to the general belief of the colloidal state of silica in natural waters, recent investigations cited show that silica is present in true solution. 29 references. B.C.R.

Slide rules for rapid solution of special equations. J. T. HOGAN. *Chemist-Analyst*, **34** [2] 29–39 (1945).—Slide rules with special scales solve complex problems with reasonable accuracy by a simple setting of slides. They may enable nontechnical employees to solve problems and save time. H. describes the theory and general equations applicable to the construction of special rules. A.P.

Spectrographic detection of selenium in the d.-c. arc flame. CYRUS FELDMAN. *Jour. Optical Soc. Amer.*, **35** [2] 180–84 (1945).—To make arc spectrograms of selenium practical, some means for repressing its volatility must be devised. A line at 2413.517 a.u. was found to be reliable, and its persistence could be improved by using a CuS matrix and adding Te. A Co line at 2413.523 a.u. would interfere except for its low intensity. Doubtful cases can be resolved by special procedures. A.P.

Tools and aims of research. JOHN J. GREBE. *Chem. Industries*, **53** [7] 833–36 (1943).—A mixture of philosophy, sociology, and workaday chemistry and physics. G. deals with the various frequency spectra: (1) electromagnetic waves, (2) De Broglie particle waves, (3) mechanical and thermal vibrations, and (4) half lives and vital cycles. He considers that some day these may be augmented to the point where they will be considered the logical starting point for all education in the sciences. Past developments in recording and controlling equipment as well as future possibilities in modernizing mechanical equipment for the home are also dealt with. A suggestion is given for the construction of an electrical balance to increase the speed of weighing. E.D.M.

PATENTS

Producing beryllium. B. R. F. KJELLGREN (Brush Beryllium Co.). U. S. 2,381,291, Aug. 7, 1945 (Sept. 18, 1941). 14 claims. Cl. 75-84.

General

All-ceramic home shows how ceramics can be used. ANON. *Ceram. Ind.*, **44** [6] 50–52; **45** [1] 49–51; [2] 44–45 (1945).—The editors and architects of the periodical *Ceramic Industry*, in cooperation with manufacturers of ceramic building materials and appliances, have designed an all-ceramic home for the enlightenment of postwar builders. It shows how ceramics can be used and why they fulfill all the needs of a postwar home. Illustrated. H.T.

Aluminum and silicosis. ANON. *Chem. Eng. Mining Rev.*, **37** [440] 256–57 (1945).—The use of aluminum and aluminum hydrate in the treatment of silicosis is reviewed

briefly; the latter compound shows some advantages. In either case inhalation is probably the only satisfactory method of administration. The Chamber of Mines (Australia) intends to advocate the spraying of mine change rooms with metallic aluminum. B.C.R.

Britain prepares for postwar comeback. ANON. *Ceram. Ind.*, **44** [6] 68–72 (1945). H.T.

Ceramic engineers for postwar service in the ceramic industry. ARTHUR S. WATTS. *Bull. Amer. Ceram. Soc.*, **24** [8] 305–306 (1945).—1 photo.

Ethyl silicate. ANON. *Foundry Trade Jour.*, **76** [1502] 87 (1945).—Ethyl silicate mixed with water and an electrolyte produces colloidal silica and alcohol, which is mixed with molding sand to form a slurry. This is poured around a wax pattern to form a mold ready for baking. Molds so made are hardened and stiffened by the deposited silica. Ethyl silicate is also being used as a mold wash for magnesium castings, being sprayed on the inside of the two-part molds. If pulverized silica is mixed with hydrolyzed ethyl silicate and air-dried, a hard, strong, porous, refractory, and acid-resisting material is formed with a crushing load of over 2000 lb./sq. in. and a temperature over 1500°C. Other possible applications of this material are discussed. A.J.B.

Foote's research family. W. F. LUCKENBACK, JR. *Foote Prints*, **17** [1] 3–9 (1945).—The personnel, equipment, and activities of the Foote Mineral Co. research laboratories are described. A.P.

Fundamental principles of automatic control. J. C. PETERS AND T. R. OLIVE. *Chem. & Met. Eng.*, **50** [5] 98–107 (1943). B.C.R.

Heat loss from steam pipes: I, II. H. BUCKLEY. *Mech. World Eng. Record*, **117** [3047] 569–73; [3048] 616–18 (1945).—The most economical thickness of heat insulation is obtained when the annual cost of the heat lost plus the interest and depreciation charges on the insulation is a minimum. B. discusses in detail the costs of steam raising and other chargeable costs and shows the heat loss from 6 in. steam pipe with different thicknesses of insulation. The effect of surface finishes on heat loss is also discussed. 4 diagrams. P.G.

History of the Hall China Co., East Liverpool, Ohio. ANON. *Bull. Amer. Ceram. Soc.*, **24** [8] 279–81 (1945).—1 photo.

Industrial health records: Industrial hygiene survey. J. J. BLOOMFIELD. *Amer. Jour. Pub. Health*, **35** [6] 559–67 (1945).—Industrial hygiene survey records are used primarily (1) as a yardstick in the control of a hazard and in the maintenance of such control, (2) as an aid to the medical department in its work of health maintenance, (3) in promotional ways, and (4) for litigation purposes, for which they are indispensable. B.C.R.

Industrial hygiene and labor. HERBERT G. DYKTOR. *Amer. Jour. Pub. Health*, **35** [5] 480–84 (1945).—Organized labor realizes the values and benefits resulting from industrial hygiene activities and wishes to have a definite part in the program. Official industrial hygienists should have closer and more frequent contact with labor to develop a better appreciation of its viewpoint and develop better cooperation. The superior attitude of labor must be replaced by sincere cooperation, influenced by competent industrial hygienists in its own organization. B.C.R.

Industrial medical records. T. V. MCDAVITT. *Amer. Jour. Pub. Health*, **35** [6] 568–71 (1945).—Industrial medical records are retained by an employer (1) as a trustee or in some other confidential or quasi-confidential capacity for the workman, (2) as evidence of the care and attention that his own agents or employees have rendered the workman, and (3) for purposes directly related to the efficient and healthful conduct of his operations. B.C.R.

Is dermatophytosis a significant occupational health problem? SAMUEL M. PECK AND LOUIS SCHWARTZ. *Amer. Jour. Pub. Health*, **35** [6] 621–25 (1945).—In the examination of 2123 cases, the following conclusions were made: (1) Only ten cases resulted in lost time, most of which was incurred during working hours for treatment purposes. (2) Shower-room floors are not likely to spread the disease, and copper-treated concrete was found ineffective. (3) Approximately 28% of the cases were found clinically positive, 34% doubtful, and 39% negative. (4) In one plant, clinically negative workers increased in winter from 16 to 54%. B.C.R.

Light, sight, and seeing. ANON. *Optician*, **109** [2823] 226 (1945).—Bare compliance with existing regulations for factory lighting is not enough for the most satisfactory results. After insuring that the conditions of lighting are the best and most suitable that can be devised, the search for working ease and efficiency should be carried to the next stage, that of insuring that the sight mechanisms are the best that can be obtained. A.P.

Mobilization of scientific resources: V, The U. S. Army. *Jour. Applied Phys.*, **16** [4] 189 (1945). **Organization of the War Department and coordination of the General Staff with operating divisions of the Army.** ANON. *Ibid.*, pp. 190–94. **Army research and development.** Brig. Gen. W. A. BORDEN. *Ibid.*, pp. 195–99. **Army Air Forces research and development at Wright Field.** Brig. Gen. F. O. CARROLL. *Ibid.*, pp. 199–202. **Development for Army Ground Forces.** Major Gen. A. W. WALDRON. *Ibid.*, pp. 203–206. **Research and Development Division, Headquarters, Army Service Forces.** Col. R. M. OSBORNE. *Ibid.*, pp. 207–10. **Research in the Technical Division, Chemical Warfare Service.** Brig. Gen. W. C. KABRICH. *Ibid.*, pp. 211–15. **Research in the Corps of Engineers.** Brig. Gen. J. W. N. SCHULZ. *Ibid.*, pp. 216–26. **Research program of the Office of the Surgeon General, U. S. Army.** Lt. Col. LEON H. WARREN. *Ibid.*, pp. 227–34. **Research in the Military Planning Division, Quartermaster Corps.** Col. G. F. DORIOT. *Ibid.*, pp. 235–43. **Research in the Engineering and Technical Service, Signal Corps: Chief Signal Officer's organization for research and development.** Maj. Gen. G. L. VAN DEUSEN. *Ibid.*, pp. 244–45. **Laboratories of the Signal Corps Ground Signal Agency.** Col. VICTOR A. CONRAD. *Ibid.*, pp. 245–48. **Signal Corps Aircraft Radio Laboratory.** Col. WILLIAM L. BAYER. *Ibid.*, pp. 248–50. **Signal Corps Pictorial Engineering and Research Laboratory.** Lt. GEORGE OWEN. *Ibid.*, pp. 250–51. **Signal Corps Standards Agency.** COL. G. C. IRWIN. *Ibid.*, pp. 251–52. **Research and development of signal equipment.** Col. ROBERT W. RAYNSFORD. *Ibid.*, pp. 252–56. For Part **IV** see *Ceram. Abs.*, **23** [10] 179 (1944). A.P.

Pneumatic vs. electrical control. E. L. STILSON. *Chem. & Met. Eng.*, **50** [5] 137–39 (1943).—Factors governing the selection of pneumatic or electrical control systems are discussed. B.C.R.

Record of pottery industry in East Liverpool district. Revised by WILLIAM H. VODREY, JR. *Ohio Geol. Survey Bull.* [4th Series], No. 26, pp. 74–81 (1923); reprinted in *Bull. Amer. Ceram. Soc.*, **24** [8] 282–88 (1945).

Selection factors and operating characteristics of control valves. R. E. OLSON. *Chem. & Met. Eng.*, **50** [5] 132–36 (1943).—The flow-lift characteristics of diaphragm motor type valves actuated by compressed air are influenced by (1) diaphragm motor pressure-travel relationship, (2) mechanical hysteresis of valve and motor, (3) controller output linearity, and (4) plug or disk shape. B.C.R.

Study and control of industrial atmospheric pollution nuisances. FRANK M. STEAD. *Amer. Jour. Pub. Health*, **35** [5] 491–98 (1945). B.C.R.

United States Patent Office inaugurates new service. ANON. *Bull. Amer. Ceram. Soc.*, **24** [8] 281 (1945).—A Register of Patents Available for Licensing is being established and will be maintained in the United States Patent Office.

Uses and value of industrial vital statistics. RUTH R. PUFFER. *Amer. Jour. Pub. Health*, **35** [6] 553–58 (1945).—In the expansion of industrial-hygiene activities, statistical data are needed for the definition of health problems. Death, cases of occupational diseases, industrial accidents, and records of nonoccupational illnesses and injury provide material for use in the industrial-hygiene program. Since the common causes of illness and injury in the general population are responsible for absences and lost time in industry, the frequency and duration of such illnesses need study for improving the health of workers. B.C.R.

Utilization of flue dust. C. S. DARLING. *Mech. World Eng. Record*, **118** [3053] 1–6 (1945).—The utilization of ash from power stations and industrial plants may become important in the future because of the tendency to use raw coals with higher ash percentage. Storage and handling systems that can be adapted to handle any quantity of ash are described. The utilization of ash should be undertaken only after investigation of the economic aspect, not from the viewpoint of the supplier but from that of the user. Particular care must be taken when dealing with subsieve analysis, and various standard sieves are compared. The thermal conductivity of fly ash is discussed. 9 illustrations. P.G.

Ventilation and dust hazard. ANON. *Foundry Trade Jour.*, **76** [1501] 65 (1945).—Dust hazards in Britain are reviewed and compared with some American standards, including those of New York State. A.J.B.

War veterans in the postwar ceramic industry. J. E. EAGLE. *Bull. Amer. Ceram. Soc.*, **24** [8] 290–92 (1945).

SEPARATE PUBLICATIONS

Cast Iron in the Chemical and Process Industries. F. L. LA QUE. Gray Iron Founders' Society, Inc., Washington 6, D. C., 1945. 28 pp. Price $1.00.—La Que, head of the Corrosion Engineering Section of the International Nickel Co., Inc., presents extensive data on the corrosion rates of cast iron exposed to the action of substances commonly handled by chemical structures. Results of laboratory and plant tests with more than 300 corrosive media, in an alphabetical range from acetic acid to zinc sulfate, are shown. The four appended tables also list the many chemicals regularly handled by cast-iron pumps and valves and those resisted satisfactorily by high-silicon irons. Factors dictating cast irons for corrosive service, the availability of the material, design for chemical-industry equipment, and many specific applications are discussed. Pointing to the corrosive-service-per-dollar factor, the booklet states that in some applications the nature of the corrosive media is such that, despite a fairly rapid attack on cast iron, no other material can be expected to render long enough service to justify a higher initial cost. Differences in the manner in which cast iron resists corrosion are related directly to the structure of the material and particularly to the presence of graphite flakes in a ferritic, pearlitic, or austenitic matrix. The corrosion-resisting characteristics of gray iron may be altered by alloying and by foundry techniques, since both affect the size, shape, and distribution of the graphite particles and influence the corrodibility of the matrix.

Health of Workers in Dusty Trades: VII, Restudy of a Group of Granite Workers. A. E. RUSSELL. *U. S. Pub. Health Bull.*, No. 269, 71 pp. (1941). Price 15c from Supt. of Documents, Washington, D. C.—The original study of Vermont granite workers was completed in 1926 and reported in *ibid.*, No. 187, which has become one of the classics of silicosis study. In 1937–1938, 116 out of the original 642 workers were re-examined, and the results are reported. A few were also re-examined in 1931. Two or three X rays of each of 19 characteristic cases are presented, and the progress of the disease can be easily followed. Tables show the progress of silicosis (*a*) in granite cutters who continued at their occupation, (*b*) in those who changed to nondusty occupations, and (*c*) in those exposed to 20 million particles of granite dust per cubic foot or less. In group *a*, the disease made moderate progress in 31 out of 64 workers and marked progress in an additional 31, while 30 had tuberculous complications. In group *b*, 6 out of 18 made moderate progress and 8 out of 18 marked progress, with 9 cases of tuberculosis complications. In group *c*, moderate progress was made in 2 cases out of 33, and there was one case of tuberculosis, in a subject who was not silicotic. Those who serve longest are most subject to change in diagnosis to the more advanced stages of the disease. Most workers who had been exposed to 40 to 60 m.p.c.f. over a period of years had silicosis, whether they changed occupation or not. Those similarly exposed to about 6 m.p.c.f. were practically free from silicosis. In the remaining group (those exposed to an average of 20 m.p.c.f.), the etiology of silicosis is doubtful, and it appears that a safe limit lies somewhere between 9 and 20 million particles. These figures apply only to granite containing 31 to 38% free silica. The figures published by the National Silicosis Conference are given for comparison, the permissible maximum safe concentrations varying from 4.5 m.p.c.f. for South Africa dust, 80% free silica, to 50 m.p.c.f. for Pennsylvania mines with 5% free silica. Suitable ventilation and medical supervision are recommended. F.S.M.

PATENTS

Binder for core sand of waste sulfite lye. CHEMISCHE WERKE (Albert A. Greth and Karl Brückel, inventors). Ger. 741,652, Nov. 15, 1943 (March 24, 1942); cl. 31*c*; abstracted in *Chem. Zentr.*, **1944, I** [16] 958.—The binder consists of mixtures of waste sulfite lye with hardenable phenol- and/or amino-condensation resins. The cores are both very strong and waterproof. M.HA.

Binders of waste sulfite lye for foundry molds and cores. F. RASCHIG G.M.B.H. (Karl Thönnessen, inventor). Ger. 743,092, Dec. 17, 1943 (March 20, 1942); cl. 31*c*; abstracted in *Chem. Zentr.*, **1944, I** [16] 958.—Urea is added to the binder, preferably in amounts of 5 to 15%. The sand cores made with this binder have a high dry strength even without additions of oil or residues of oil or fat distillation. M.HA.

Cyclic organosilicon compounds. W. I. PATNODE AND R. W. SCHIESSLER (General Electric Co.). U. S. 2,381,002, Aug. 7, 1945 (March 4, 1942). 4 claims. Cl. 260-607.—1. A silicon compound having the formula $(Cl_2SiCH_2)_x$ wherein x is equal to at least 3.

Halogenated organosilicon compounds. W. I. PATNODE AND R. W. SCHIESSLER (General Electric Co.). U. S. 2,381,000, Aug. 7, 1945 (March 4, 1942). 8 claims. Cl. 260-607.—1. An organosilicon compound having the formula $X_3Si(CH_2)_nSiX_2Y$, where X represents a halogen atom, Y represents an atom selected from the group consisting of hydrogen and a halogen atom of the same type as that represented by X, and n is an integer and is at least 1 and not more than 4.

Making terra cotta, ceramics, and porcelain impermeable. GIOVANNI MAURI. Swiss 225,956, May 17, 1943 (June 8, 1942); abstracted in *Chem. Zentr.*, **1944, II** [1/2] 63.—The porous objects are dipped into molten sulfur at 125°C., quickly heated in it to 180°, and then quenched in cold water. To the molten sulfur, neutral substances or coloring matter can be added, e.g., aluminum or bronze powder or graphite. M.HA.

Manufacture of plastic masses for foundry cores, etc. FERDINAND C. WEIPERT (Soc.). Belg. 449,117, Nov. 2, 1943 (Feb. 9, 1943); abstracted in *Chem. Zentr.*, **1944, I** [25/26] 1422.—Quartz sand (100 kg.) is mixed with 4.5 magnesite and 6 kg. $MgCl_2$ lye. M.HA.

Preparation of organosilicon halides. E. G. ROCHOW (General Electric Co.). U. S. 2,380,995, Aug. 7, 1945 (Sept. 26, 1941). 17 claims. Cl. 260-607.—1. The method of preparing organosilicon halides which comprises effecting reaction between silicon and a hydrocarbon halide.

Preparation of organosilicon halides. M. M. SPRUNG AND W. F. GILLIAM (General Electric Co.). U. S. 2,380,999, Aug. 7, 1945 (March 4, 1942). 9 claims. Cl. 260-607.—1. The method which comprises effecting reaction at an elevated temperature between silicon and a halogenated hydrocarbon in the presence of an inert gas.

Refractory mold. P. F. COLLINS (Austenal Laboratories, Inc.). U. S. 2,380,945, Aug. 7, 1945 (July 11, 1942). 6 claims. Cl. 22-188.—1. A plastic mix for making a refractory mold, the mix comprising a refractory filler, and a binder comprising a noninflammable liquid which in its original condition and prior to mixing therewith of the refractory filler contains inorganic silica substantially all of which is present as silica in the form of an aqueous sol with a relatively small amount of alkali-metal compound.

THE BULLETIN SECTION

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ALLEN PERCIVAL GREEN

PERSONAL HISTORY OF ALLEN PERCIVAL GREEN

Allen Percival Green, president and founder of the A. P. Green Fire Brick Company with general offices at Mexico, Missouri, was born in Jefferson City, Missouri, was educated in the public and private schools of that State, and received his training as a mining and civil engineer at the University of Missouri School of Mines and Metallurgy, Rolla, Missouri.

After graduation, Mr. Green began his engineering career working on various railroad, mining, and hydraulic projects throughout the West. After finishing a job of rebuilding a lock in the Monongahela River at Pittsburgh in 1900, Mr. Green entered the employ of the then Harbison & Walker Company, manufacturers of refractories, as engineer. With this Company, he advanced to a Company directorship, then became part owner of a firebrick plant in St. Louis, and finally founded his own Missouri plant at Mexico, Missouri.

The Firebrick Industry

Mr. Green's first actual contact with the firebrick industry was in 1900 when he took the job as engineer with the Harbison & Walker Company in Pittsburgh. Soon after, he was drafted into their Sales Department. This led to his being made general sales manager and a director of the Company. During his services there, Harbison-Walker purchased a large number of plants in Pennsylvania, and a great expansion and consolidation took place which resulted in a capacity of more than one million brick per day and a capital of thirty-five million dollars. As a director and official, he was actively connected with the development by Harbison-Walker of silica, chrome, magnesite, coke-oven brick, and rotary cement kiln liners. As general sales manager, he developed the technique of securing and training salesmen and for handling sales territories, sales reports, and office records that is now used generally throughout the refractories industry.

For some time, Mr. Green had been attracted to the unusually high quality of the north Missouri fire clays and was convinced that they were not only the world's finest quality but that there was an almost unlimited supply. He believed the future growth of the industry would be there.

In 1905, he resigned from Harbison-Walker and moved to St. Louis, where he purchased an interest in the Evans and Howard Fire Brick Company, a 75-year-old organization of that city. Here, as vice-president and general manager, he made chrome and magnesite and the first successful blast-furnace stove and steel-mill brick made from Missouri fire clays, and, as a result, greatly increased the business of this Company. He made the first blast-furnace linings of Missouri fire clay to make world tonnage records.

During this period, he designed and built this Company's Clayton, Missouri, plant, which is now owned and operated by the General Refractories Company, and another plant at Athens, Texas. Finding that his connection with this Company did not give him latitude for the development he desired, he sold his interest and, in 1910, bought the plant of the then-operating Mexico Brick and Fireclay Company, located at Mexico, Missouri. Although small and unsuccessful in its operations, Mr. Green realized that it possessed vast fire-clay reserves of the highest quality. Since 1910, as sole owner, Mr. Green has built his Company organization into one of the largest and most advanced refractory organizations in the world.

Technique of Manufacturing Firebrick

The philosophy of the Company is the philosophy of the man behind it. Allen P. Green was never completely satisfied with the technique of manufacturing firebrick in the old-style plants. He has always pioneered in new methods and new products with ideals of service to industry. In 1918, tunnel kilns were being developed in Europe and he became so interested that he made frequent trips there to examine and check their operations and possibilities. In 1925, he built the first tunnel kiln for firing high-grade refractories at Mexico, Missouri, which is still operating. He then designed the present A. P. Green plant of eight tunnel kilns incorporating not only the savings and efficiency of the tunnel kiln but humidity driers and improved machinery for grinding and processing, all complete in one economical unit.

The present size and reputation of the A. P. Green Fire Brick Company proves the efficiency of this modern plant which has served as a model for refractory manufacturers all over the world. Today, Missouri plants owned and operated by the five largest refractory manufacturers in the world prove the conviction A. P. Green had way back in 1905 that the finest clays in the world were found in north Missouri.

During this thirty-five years as president of the A. P. Green Fire Brick Company, Mr. Green has been directly or indirectly responsible for many of the most important developments in ceramic refractories in the world. He was the first to mine fire clay in open pits. He was active in the discovery and promotion of diaspore for superbrick. He pioneered the development of refractory specialties and insulating firebrick. He was among the earliest owners of suspended wall and arch companies. His Company was among the first to install a laboratory and today, in addition to the work carried on by its research laboratory, a plant laboratory controls and supervises all plant operations. Throughout these many years, the Company's sales technique has been developed to the point where it is considered a model with customers and its own industry alike.

Mr. Green has traveled extensively throughout the world, organizing export connections, agencies, and plants. He has visited and is acquainted with operators of nearly every important refractory plant in the world. He was one of the original eight organizers of the American Refractories Institute and has served as director and vice-president since its organization in 1912.

Honorary Degrees

For his contributions to engineering, Mr. Green has received the Honorary Degree of Doctor of Engineering from the Missouri School of Mines and Metallurgy, Rolla,

Missouri; an Honorary Degree of Doctor of Science from Alfred University, Alfred, New York;* and the Honorary Degree of Doctor of Laws from Westminster College, Fulton, Missouri.†

In addition to being president of the A. P. Green Fire Brick Company, he is president of all the United States and foreign subsidiaries of the A. P. Green Company. He has served for many years as trustee of colleges and director of banks, railroads, and welfare organizations. At present, he is a director and member of the Executive Committee of the Wabash Railroad, the Ann Arbor Railroad, and the New Jersey, Illinois & Indiana Railroad; director, Mercantile-Commerce Bank & Trust Company, St. Louis; trustee, Westminster College; member, National Advisory Council, and regional director, Region 8, Boy Scouts of America; director, Y.M.C.A., Missouri; and has just finished a four-year term as chairman, Board of Visitors, University of Missouri.

Allen P. Green is president of the A. P. Green Engineering and Management Company, a division, which serves as consulting engineers in the designing, building, and operation of refractory manufacturing plants in countries outside the United States.

Mr. Green is a member of the American Refractories Institute, The American Ceramic Society, the American Society of Civil Engineers, Mining Engineers, and Electrical Engineers, and the American Chemical Society.

Mr. and Mrs. Green have three daughters and two sons. All sons and sons-in-law are associated with the A. P. Green Fire Brick Company. Allen P. Green, Jr., is a vice-president and assistant to his father; Robert S. Green, a vice-president, is now on leave as a lieutenant with the Navy; Arthur D. Bond, who married Elizabeth Green, is a vice-president in charge of export sales; Walter G. Staley, a West Point graduate who married Martha Green, is a vice-president now on leave as a lieutenant colonel with the Army; Neal S. Wood, who married Josephine Green, is secretary of the A. P. Green organization.

Mr. Green is an elder in the Presbyterian Church, a Thiry-Second Degree Mason, a Knight Commander of the Court of Honor, Supreme Council of the Masonic Order, and a member of the Order of Shriners.

Recreation

Mr. and Mrs. Green's home is Huntingfield House in Mexico, Missouri; their winter home is in Miami Beach, Florida. Mr. Green manages successfully 3000 acres of farms owned by the Company. His recreation is duck and quail hunting in Missouri, fishing in Missouri and Florida, and horse breeding and developing. All of his life he has been closely connected with athletics and has been adviser to many school and athletic organizations.

* See the June, 1943, *Bulletin*, p. 200.
† See the January, 1934, *Bulletin*, p. 28.

CAPTAIN ARTHUR J. BLUME

Captain Arthur J. Blume, whose paper, "The Ceramic Industry and the Returned Serviceman," appears on the following page, was born February 21, 1904, at Portland, Ohio, and attended grade school in various southern Ohio towns. He attended high school at Jackson and Ironton, Ohio. In 1922, he entered the Ohio State University, graduating from the school of ceramic engineering in 1927. While at Ohio State University, he was a member of the R.O.T.C. and became an Army Reserve Officer at the time of graduation. He held positions as ceramic engineer with the McLain Fire Brick Co., Pittsburgh, Pa., the Atlantic Terra Cotta Co., Perth Amboy, N. J., the Allied Engineering Co., Cleveland, Ohio, and the Square D Co., Peru, Ind.

In June, 1942, he was ordered to active duty and assigned to the Mobilization Section of the Fifth Service Command. His first assignment was Induction Officer at the Army Induction Station at Cleveland, Ohio. In February, 1943, he was made Commanding Officer of the Armed Forces Induction Station at Huntington, W. Va., where selectees were processed for both Army and Navy. In April, 1945, he was transferred to Fort Hayes, Ohio, and placed in command of the Induction Station there.

Captain Blume has been a member of The American Ceramic Society since 1934 and is a member of the Institute of Ceramic Engineers.

Technical Publications

(1) "Insure Better Periodic Kiln Firing with Standardized Schedule," *Brick & Clay Record*, **84** [6] 206–207 (1934).

(2) "Notes on Periodic Kiln Firing," *Bull. Amer. Ceram. Soc.*, **14** [1] 19–20 (1935).

(3) "Muffle Kiln Firing," *ibid.*, pp. 20–21.

(4) "Determination of Fusion Characteristics of Nonplastic Materials," *ibid.*, **20** [5] 153–54 (1941).

(5) "Testing Ball Clays for Low-Tension Electrical Insulators" (Symposium on Testing and Classification of Ball Clays), *ibid.*, **21** [11] 252 (1942).

Captain Arthur J. Blume

THE CERAMIC INDUSTRY AND THE RETURNED SERVICEMAN*

By Captain Arthur J. Blume, FA

Abstract

The mental attitudes of the returned serviceman and his adjustment to industrial life are discussed. It is pointed out that the effects of military experience vary with the age and the previous industrial experience of the individual. Several hints on handling the returned man are presented.

I. Introduction

At the present time, there is much thought and discussion concerning the postwar problems of demobilization. This is in direct contrast with the state of affairs at the close of the last war. At that time, the general public had no advance warning of the results of discharging large numbers of men from the services. There was little or no realization of the problems to be faced in the readjustment of men to civilian life. Military life had changed the mental outlook and attitude of these returned men. They had developed prejudices, likes, and dislikes which were strange to the average civilian. In many cases, lack of understanding by those who remained at home was construed by the serviceman as lack of sympathy. The returned soldier felt that his efforts were not appreciated; that, since the war was over, his welfare was of no further interest to others. The social unrest in the years following the war is well known. Some of this unrest can be attributed to the reactions of returned servicemen.

Once again we are facing these same problems. Now, however, our military and civilian leaders are devoting a great deal of time to advance planning so that we will this time be prepared for the war's end. There is more general discussion, and the general public apparently realizes that there is a problem to be faced.

II. Readjustment to Civilian Life

As members of a large basic industry, almost every one of you will have some contacts with returned servicemen. You may hire them, you may work next to them, you may possibly work under them. Your share in the readjustment of these returned men may be active or passive, but it will help if you have some idea of their problems. One of the big problems is that of the man who has been crippled, who has lost the use of his eyes or arms or legs. This problem is not to be minimized, but it is nevertheless one for the specialists, for the experts in rehabilitation. The broad problem you must meet is that of the mental attitudes of the servicemen returning to your plant or office.

In using the terms mental attitudes and readjustment, the author does not mean to imply that the average man returning from service is a psychoneurotic or a case for a mental hospital. Essentially the returned man is the same man who went into service, except that he has had some experiences which have left their imprint. Some recent magazine articles would have us believe that the average returned man is a nervous wreck or that he has developed antisocial tendencies. This is definitely not the case.

When we examine a man to determine his fitness for military service, we recognize that he must be able to adjust himself to new conditions and to a way of life that is radically different from that to which he was accustomed. He must learn group living. He must learn to obey. He must learn that his personal likes and dislikes do not receive much consideration. This requires adaptability, and many men are rejected for service when their past history shows lack of ability to adjust to new conditions. The man leaving service must readjust, must again change his mode of living. He must again make decisions which were denied him in his military environment. This readjustment, although not so difficult as the adjustment to military conditions, must be considered.

III. Return of the Ceramic Engineer to Industry

There are two general classes of engineers in service: (1) the younger men who entered service directly from college and (2) the older men who had had some industrial experience before their military service.

(1) The Younger Engineer

It is generally agreed that college prolongs mental adolescence, i.e., the boy in college is still dependent on others for directions as to what to do and when to do it. The boy who goes to work immediately after high school is more mature at the end of four years of work experience than the college man at graduation. What has the Army done to the young man who entered service before or shortly after graduation? To some extent it has prolonged his dependency on others. Military life is quite different from civilian life. All are under the domination of those of higher rank. This is true to a degree not readily imagined by those who have not had military service. The soldier is told when to go to bed and when to get up. The cut of his clothing, the color of his socks and ties, and the length of his hair are all set by regulations. The type of work he does and the methods used are determined by those above him. A great part of his recreation and social life is planned for him.

When the young man returns and goes into a civilian job, possibly for the first time, he may still be somewhat dependent. He will require sympathetic and intelligent handling so that he may adjust readily to his new environment. This does not mean that he is to be babied or coddled. He would be the first to resent this kind of treatment. It is important, however, that he not be turned loose in a laboratory or a plant and expected to do a good job without considerable instruction and supervision. His Army experience has taught him the military system of the

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* Forty-Seventh Annual Program, The American Ceramic Society, Inc., 1945 (General Session, No. 5). Received April 16, 1945.

The opinions presented in this paper were developed by personal interviews with selectees and overseas returnees and through discussions with psychiatrists and psychologists on the author's staffs at the induction stations where he has served.

direct chain of command. The sometimes informal directions given by plant supervisors may not have the ring of authority to which he is accustomed.

Another fact to be faced is a deeply buried but ever-present resentment of authority. Having been under the complete domination of those over him, the serviceman resents this domination even while being dependent on it. There is, moreover, the social gulf in military life between those receiving orders and those giving them. This is especially the case between officers and enlisted men. In spite of our American democratic traditions, the gulf is there, even when the advantage of breeding and education is on the side of the enlisted man.

With this background, it will seem strange at first to eat dinner with the superintendent or to call the department head by his first name.

The returned man, moreover, is not going to want a long rest or vacation before getting to work. Most returned men have an intense desire to get to work and into normal civilian life as soon as possible.

From the technical standpoint, the young engineer will have been completely separated from his specialty for a matter of years. He will have forgotten many technical details. Formulas and technical terms will not be as familiar as might be expected. On the other hand, military training may have given him technical training that will be to his advantage. The services frequently have to improvise, and the knack of making things work in spite of lack of parts and equipment is invaluable. Our schools are studying the subject of refresher courses which should help bridge the gap caused by military service.

Another problem that is being thought of by those in service is that of the younger man who has attained fairly high rank in service and must again start at the bottom in industry. This is a personal problem of the individual concerned. The man who had the ability to get ahead in military service may also have the ability to adjust himself to this situation.

Military service will have done many things for the young engineer. In spite of the prolonged dependency mentioned earlier, it will have matured him in many ways. He will have learned to do the job assigned him. He will be used to the idea that good performance is required of him. He has learned teamwork and loyalty to the group. He has learned to take orders and to give them. He has rubbed shoulders with men of other social strata and other beliefs. He will have developed respect for the man who can produce and who is dependable, regardless of his background. Possibly most important of all, he has learned to get along with other men. Sometimes the engineer just out of school is self-centered and impractical. Military experience will have insured his adjustment to group living and to group working.

(2) The Older Engineer

The industrial plant is an old story to the older engineer, and, as he was adjusted to civilian working conditions, we would not expect much difficulty in his readjustment. He has had new experiences, however, which will have left their mark. There is first the question of returning to his old job. If he was not entirely satisfied with his civilian job before going into service, he now has a good opportunity to find a new one. He may have been satisfied with his old job, but military training and experience may have broadened his outlook and made him want a change. Military life will have made him more personnel-minded. Many engineering graduates are prone to think too much in terms of raw materials and equipment. The big factor of man power is sometimes overlooked until we are forced to deal with it. The Army, in spite of all its mechanization, is primarily an organization dealing with man power. It is impossible to spend much time in service without becoming very conscious of the problems of procurement, classification, and training, of trying to fit the right man into the right job. Most of the older men will come back from service with new ideas on employee management and training.

The older man returning to his old place of employment will have some well-developed prejudices. One of these will be toward the man of his own age who remained at home and who has now advanced in the industry. The returned man will resent the advancement of the other man and will feel that his military service should place him at least on a par with the man who did not go into service. It is not probable that the older man will care for additional schooling.

(3) Typical Attitudes of All Age Groups

Some attitudes are common to servicemen of all age groups. Almost all servicemen look forward to a normal life and a normal job. There will be some restlessness for awhile. These men have been on the move and change of scenery has been the normal thing.

Some of this restlessness may be due to an urge to get ahead quickly to make up for time lost while in service. These men feel that they cannot afford to spend long years of apprenticeship. Their economic development has not kept pace with their social development. While in service they may have acquired wife and family with attendant added needs and responsibilities. Quite naturally then there is a drive or compulsion to catch up so that they can adequately meet these responsibilities. Management should recognize this drive for what it is and not feel that this type of man is unduly aggressive or unduly ambitious.

Another noticeable trait may be an indifference to administrative details. Men who have had combat experience have had their thinking reduced to the fundamentals of survival. Anything less than a life-and-death decision may seem unimportant. This attitude usually disappears after a short time under normal civilian conditions.

Most servicemen will have developed some additional skills. Physically the average man will be in better shape than when he went into service. Occasionally you will find a man who feels that, now that he has been in service, the world owes him a living. Most of these, however, will have been weeded out of service by some type of discharge other than honorable. An honorable discharge from service will indicate that the man receiving it has made a good adjustment to military life. It will be pretty good insurance that he will adjust satisfactorily to industrial life.

IV. The Rejected Man in Industry

Many men are rejected for military service because of psychiatric findings. Some others are inducted and later discharged for psychiatric reasons.

There is some misconception regarding these men. The fact that they are unable to adjust to military life does not mean that they would not make good employees in industry. A great number of these men will adjust to industrial life. In fact, some of the traits that are undesirable in a soldier may be of unusual value in certain jobs.

Some of our most highly trained technical men do not readily adjust to the rigors of military service. Science and industry, however, will be the losers if their talents are not utilized. It is unfortunate that many of these men of above-average mental ability should be tagged by terms that are but partly understood by the general public. Good personnel management will make effective use of these men.

V. Conclusions

(1) Military service will have left its mark.

(2) There will be a mental readjustment from military to civilian life.

(3) The ceramic engineer with little or no industrial experience will require close supervision for a short period.

(4) The younger man may have developed a resentment of authority.

(5) The average man wants to return to industry without a long vacation.

(6) Military experience will have some beneficial aspects.

(7) The older engineer may not be satisfied with his former job.

(8) Military experience will have developed an interest in personnel.

(9) The honorably discharged man is a good investment.

(10) Men who are unable to adjust to military life will in many cases be valuable to industry.

ABSORPTION BY THE USE OF KEROSENE AND A VACUUM*

By Mark Sweitzer

Abstract

A comparison is made between the common boiling-water method of obtaining absorptions and a kerosene and vacuum method in which the specimens are immersed in kerosene in a vacuum chamber. The latter method is found to be a time-saver; 115 minutes gave absorptions similar to 10 hours in boiling water.

I. Introduction

An attempt has been made to find a practical, fast, and comparatively accurate method of obtaining absorption of semivitreous bisque ware. The importance of absorption in the control of many tunnel kilns warrants the investigation of this simple physical test.

The literature on the subject of absorption is too extensive for a complete review, but attention is called to the interesting discussion by R. F. Geller which appeared in the January, 1943, *Bulletin of The American Ceramic Society*, p. 12.†

II. Procedure

The equipment used in this investigation consisted of a cylindrical tank 1 foot in diameter and 2 feet high, with a machined flange about 2 inches wide and a machined lid. No gasket was necessary. A heavy grease seal worked very well. This tank was connected through the side to a 2- by 2-inch pump pulled by a $^1/_2$-h.p. motor. An ample vacuum of 29 inches of mercury was produced in 30 seconds.

Samples were taken from the cross section of a tunnel kiln. The kiln furniture was set up so that there were five shelves; one pair of samples was taken from each side and the center of each shelf. The samples consisted of two bisque saucers taken from adjacent positions near the center of a bung of about two dozen pieces. There were, therefore, fifteen pairs of samples. As they were made from the same body mix and fired as described, each pair was assumed to have identical absorption properties. One of each pair was used for the successive kerosene absorptions. For comparison, the other of each pair was given the successive absorption treatments similar to the more common boiling-water method but altered for comparison purposes. Results are shown in Table I and Figs. 1 and 2.

With the water method, the time (Table I) indicates actual boiling time, as the ware was put into boiling water; with the kerosene-vacuum method, it indicates the actual time starting when the vacuum was turned on. Thus it includes the time during which the vacuum was built up (approximately 30 seconds). In addition, 15 minutes were allowed in each case for cooling and draining before weighing on a balance accurate to 0.1 gram. In the case of water absorption, cold water was run into the boiling vessel and allowed to overflow until the water became cool. The ware was allowed to stand in the cool water for 11 minutes; the remaining 4 minutes were required to drain the ware. In the kerosene-vacuum method, the entire 15 minutes were used to drain the ware, as this was found to be the most efficient method with respect to time.

The absorption is given in terms of water; i.e., the actual per cent absorption of kerosene is divided by 0.8 (the specific gravity of the kerosene used).

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* Forty-Seventh Annual Program, The American Ceramic Society, Inc., 1945 (Supplementary Title, No. 8). Received April 16, 1945.

† Part of Symposium on "Standard Tests and Specifications of the White Wares Division" held at the Forty-Fourth Annual Meeting, The American Ceramic Society, Inc., Cincinnati, Ohio, April 21, 1942.

TABLE I

OIL VS. WATER ABSORPTIONS OF SEMIVITREOUS SAMPLES

Time of treatment (min.)	5	10	25	55	115	600	12,000	30,000	60,000 plus soak
Avg. absorptions in oil (%)									
Lowest 5	8.24	8.36	8.50	8.52	8.96	9.32	9.40	9.36	
Medium 5	8.66	8.96	9.06	9.30	9.40	9.98	10.06	10.06	
Highest 5	10.68	10.92	11.04	11.38	11.56	12.02	12.12	12.10	
All 15	9.19	9.41	9.53	9.80	9.97	10.44	10.53	10.51	
Avg. absorptions in water (%)									
Lowest 5	6.94	7.38	7.42	7.88	8.04	9.14	9.94	9.94	10.20
Medium 5	7.10	7.74	7.96	8.26	8.54	9.58	10.44	10.36	10.76
Highest 5	9.66	9.98	10.04	10.50	10.88	11.62	12.66	12.42	12.62
All 15	8.03	8.38	8.47	8.88	9.15	10.11	11.01	10.91	11.09
Log of time (min.)	0.699	1.00	1.398	1.740	2.061	2.778	4.079	4.477	4.778

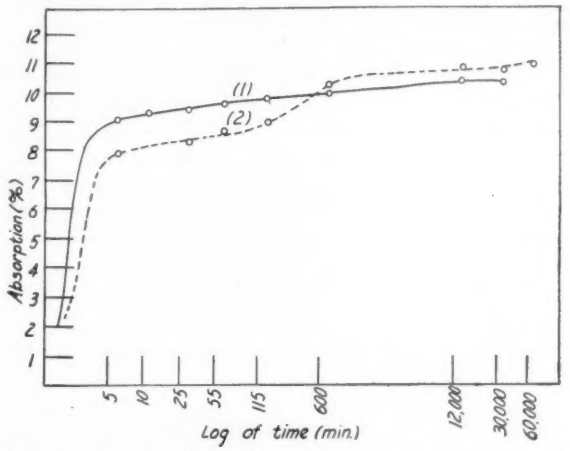

FIG. 1.—Average absorptions of all samples. *Curves:* (1) in oil; (2) in water.

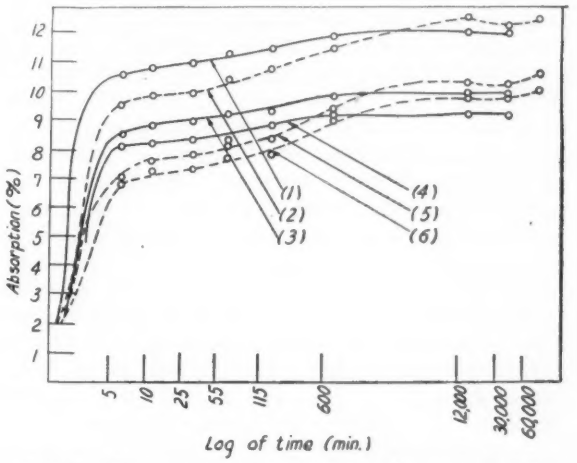

FIG. 2.—Average absorptions of samples separated into high, low, and medium absorptions. *Curves:* (1) highest 5 in oil and (2) in water; (3) medium 5 and (4) lowest 5 in oil; (5) medium 5 and (6) lowest 5 in water.

III. Discussion

In the case of oil and the vacuum, a nearly constant weight was obtained, but with boiling water the weights differed.

After 200 to 500 hours of boiling, there was a 0.1% decrease in the average absorption of the fifteen samples, but the five samples that showed the lowest absorption at 200 hours of boiling showed the same average absorption at 500 hours. The five samples with the greatest absorption showed the greatest decrease in weight. Their absorption dropped 0.24%. Hydrolysis of the body and abrasion possibly explain this drop in weight. Abrasion was noted where the pieces came in contact during boiling. Both of these factors would be expected to more greatly affect the lower fired pieces with the higher absorptions. The water used for absorptions acquired a slick, soapy quality that might be any one or a combination of alkalis, silica gels, and rehydrolized clay.

The final treatment of 1000 hours of boil and 1000 hours of soak was an attempt to reach a constant, but there was still a change in weight after the 500-hour treatment. All pieces were heavier than any previous weight. The 1000 hours of soak probably added weight above the 1000 hours of boiling.

The absorptions are plotted (Figs. 1 and 2) against the log of the time to keep the curves of reasonable shape.

(1945)

IV. Conclusion

The oil-vacuum method is more foolproof and possibly is more accurate. As 115 minutes of the vacuum and oil treatment gave an absorption only 0.54% below the 500-hour treatment, it was chosen as the best and is equivalent to more than 10 hours of boiling in water. Obviously, for control work the saving in time required for comparatively accurate results makes the oil-vacuum method worth consideration.

SCIO OHIO POTTERY COMPANY
SCIO, OHIO

BRICKLAYERS ARE NEEDED

The Structural Clay Products Institute, Washington, D. C., has released estimates that postwar construction will call for the use of 18 billion brick equivalents each year and that 154,000 masons will be required to lay these brick. At present, it is estimated that there are only 91,000 bricklayers in the country, including those in the armed forces. Vocational schools are being called upon to train more mechanics in this field. High-school courses in bricklaying are proposed as well as intensive courses of about ten weeks' duration.

It is quite probable that the production of brick and the volume of brick masonry in the postwar period will be limited by the skilled mechanics who are available.

CERAMIC ART PRODUCTION LABORATORY*

A progress report of Ohio State University's new educational project for research and practical training in product design and technology

By Arthur E. Baggs†

The Ceramic Art Division at The Ohio State University, Columbus, Ohio, has been promoting the establishment of a small pilot plant. In this workshop, advanced students under professional direction will undertake practical quantity reproduction of well-designed ceramic articles which have been created by staff and students. Large enough editions of these items will be made to permit sales tests in the market. This idea has been approved by the heads of all the University's branches of ceramic activity. It is a good educational tool which ought to be put to work.

Because of budget limitations, the University was unable to finance the complete program. It could, and will, furnish most of what may be called "overhead expenses," that is, space, light, heat, power, and fuel for kilns. The general directing staff of the project will be made up of persons already paid by the University. To operate the little factory, at least two competent professionals will be required who will give full time to that work. These constitute new personnel. Salaries of these keymen and funds for such extra labor as may be needed to supplement the work of students are expenses which the University could not undertake at first. It was not prepared, moreover, to equip the new workshop, which is an essential part of the plan. Outside funds had to be secured.

Through The Ohio State University Development Fund, with the cooperation of ceramic industrial men, about $12,000 has now been raised in contributions of cash and equipment. Many of you have helped in this support. Many others will wish to have a part in further underwriting the project so that it may be sure of a fair chance to prove its worth.

Without waiting longer for added backing, the installation of the plant has been started. It will be housed in two adjoining rooms in the rear of Hayes Hall which were formerly occupied by the Department of Military Science. In these rooms, new floors, adequate floor drains, sinks, etc., have been provided. Electric connections for the operation of the various machines are now in place, as are the required facilities of gas, water, compressed air, and increased lighting. In process of installation are a Simpson dry mixer (gift of the manufacturer) and a gas kiln of approximately 12-cubic-foot capacity equipped with Maxon premix burners, a Micromax recording pyrometer, and automatic control devices. Another kiln of similar capacity will be built beside the first, so that a continuous flow of product will be possible through use of the kilns in alternation.

Most of the ware will be made by casting or jiggering. The layout of the plant provides for an excellent mold shop which will be not only the source of the plant's many and diversified working molds, but will be a first-rate place for advanced students to learn professional moldmaking under the plant's mold expert. Two 40-gallon mixers will handle the preparation of casting slips. A deairing auger machine will prepare plastic clay for the jiggers. A centralized drier will enclose two units of movable stillyards. It is planned to handle most of the ware in process throughout the workshops on stillyard cars of this type.

Machinery and equipment are, of course, not now easily available. Much is on order, with prospect of delivery next summer. It is hoped to have the shops ready to begin production of a few items at the opening of college in October, 1945. We are glad to be able to look forward to the actual starting of this long-desired activity. We believe it will be helpful in the general postwar effort to develop better American ceramic design. We think it is a step toward more realistic training for prospective designers. It has been delayed like many other plans in these war days. But it is now definitely on its way.

As a memory refresher, here is a brief review of the Production Laboratory plan:

(1) *What kind of a plant, how operated and directed?*

It is to be a miniature factory equipped to do efficient work in the usual industrial processes. It will be manned by at least two experienced professional craftsmen. One of these will be an expert moldmaker. These keymen will keep moving a continuous flow of products. They will be coordinators and supervisors of advanced students who will work in the various activities of the plant. Members of the regular teaching staff will also take active part, as their available time permits, in designing the ware and in direction of general policy. But continued, steady plant operation will be the responsibility and function of the special keymen. It will not be an overtime, added duty for busy teachers. That plan would not work.

The Ceramic Art staff, however, will assume responsibility for the designing or selection of what the plant will make. They will consult with the other campus Ceramic Departments and with representatives of industry and store buyers, in their effort to arrive at wise decisions. They want to keep the general level of products high in artistic and technical quality. They hope to maintain such quality as the essential characteristic of the plant's offerings. They intend to keep the design policy wide open to fresh ideas, rather than to follow too closely and safely the trend of current best sellers. This may result in occasional complete failure. It may also bring a discovery now and then.

Exploration in design and technology will be a major purpose of this pilot plant. Its small size and flexibility will give it freedom to try innovations in design or technical procedures, such as body glaze and process developments, which large plants could not safely undertake. It will

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* Presented at the 1944 annual fall meeting of the Ohio Ceramic Industries Association, Columbus, Ohio. Reprinted from *Ohio Ceramic Industries Association News Letter*, June 26, 1945.

† Professor of Ceramic Art, The Ohio State University, Columbus 10, Ohio.

attempt to pioneer in the development of promising ideas, even before they have been proved acceptable to the market or of demonstrated value to industry.

(2) *How will the products of the plant be marketed?*

It is planned to place the ware on sale in several key stores in various sections of the country. Within a few months, sales records from these stores will indicate relative consumer opinions. Some items will move fast, others will be duds. It is the sort of Gallup poll which could inform manufacturers. That is the kind of thing which designers and teachers of design want to find out. It is information which only customers can really furnish. Even experienced buyers sometimes make mistakes in prophesying what the public will accept, especially when the article to be judged lies just a bit outside the obviously popular trends of the moment. The new items continually going out from this plant can serve in a small but significant way as a market research in ceramic design.

(3) *How can the project attain its goal of becoming a continuous, self-supporting research?*

Through direct returns from sales in the stores and in less degree from modest royalty arrangements, which may be made with manufacturers who may wish to take over for large volume production certain successful designs which have been developed in the pilot plant and proved in its market tests. All the plant's creations will be available to industry if it wishes to use them. In such cases, it seems only fair and desirable that an industry thus accepting a valuable design property will make some return contribution to the continued support of the project which created it. Good design ideas always have been copied or closely imitated as soon as they proved salable. Even this unprofitable kind of recognition will prove the project's usefulness to ceramic art. But, we believe that most manufacturers who wish to take over one of the successful designs will also wish to help the activity which created it. It is not expected that the project will attain complete self-support for at least two years after production starts. Experimental development work is costly and the plant has continued exploration as its goal, rather than the ambition to develop a nice little line and produce it at a profit. Its purpose is to start good things which others will carry on to full commercial possibilities. That seems a legitimate thing for a University laboratory to do, and a service which deserves help from industry.

(4) *Why will the project be valuable as an educational tool?*

The little factory will be a constant demonstration of the practical aspects of the art which students are studying in classroom and laboratory. Advanced students will have opportunity to work in the designing and production of ware on a quantity basis. It will be for them a halfway station between the individualized production of the classroom or studio and the closely controlled routine of a large commercial plant. They will begin to realize some of the manufacturer's problems of making and selling. That will be good for them and good for their teachers as well. Such a link between the classroom and the future job should tend to give the student a clearer vision of the true value of both theory and practice in the field of his chosen interest.

This little plant can furnish a laboratory for graduate study and research. As a future development, it seems reasonable that certain graduate students may work here on specific ceramic art problems of design or technology, financed by manufacturers on a fellowship basis, just as fellowships in the Engineering Experiment Station are sponsored. It promises to be in every way a useful addition to the University's facilities for ceramic education.

(5) *Is the initial development period completely underwritten?*

No. Twelve thousand dollars in hand will equip the shops, but will leave an inadequate sum to provide new personnel and operating expenses even for the first six months. But we are going to start, with confidence that more backing will come from men in the industry. An additional $5000 will see it through the first year of operation. The second year ought not to require a subsidy of more than $5000. The third year should need less subsidy. If the first year shows good results, the rest will follow. An additional $5000 is the key to the first year. Will all you good men who want to come to the aid of the party please write a note to Oscar Thomas of The Ohio State Development Fund saying, "I am interested in helping the Ceramic Art Production Laboratory"? He will tell you how it can be done.

A MESSAGE FROM ED AND MARY SCHEIER, PUERTO RICO DEVELOPMENT COMPANY, SAN JUAN, PUERTO RICO

Here we are at last in Puerto Rico! A beautiful tropical island—not nearly so hot as New York and Trenton.

Everyone we visited in Trenton was so cordial, allowing us to spend considerable time in their factories. Engineers took us through the plants and explained every operation in such detail we got a great deal of valuable information we probably could not have got in any other way.

We will be working here for the Puerto Rico Development Co. It is an organization set up by the Insular Government to initiate and develop industries on the Island.

All of the developmental work for heavy clay products has been completed and they expect to have a quite large plant in operation within a year.

Ed and I are to develop a dinnerware and "Art Weave" line and train key people to carry on this kind of work. This takes us back to the arguments about artists in industry that always came up in the forums at the Syracuse Museum exhibitions. I hope we can prove that artists, with a knowledge of clay and experience in designing in it, can be helpful to industry. Watch for our "line"! It will be marketed mostly in Puerto Rico.

The Island has large deposits of just about every kind of clay—in fact, the Island is just about all clay. Oil is brought in from Aruba, 400 miles away, for fuel. It is quite low in cost.

As soon as the work develops further, we will give you more details.

Warmest regards from both,
EDWIN AND MARY SCHEIER

Mr and Mrs. Scheier are on leave of absence from the University of New Hampshire (see the August, 1945, Bulletin, page 313).

THE CONSUMER CREDIT POTENTIAL IN POSTWAR DISTRIBUTION*

By R. H. Stout†

Abstract

Consumer credit is little older than the new concept of ceramics as an industry, yet it has contributed to decreasing costs of production and resultant enjoyment. When consumer credit has not been present, intelligently utilized mass distribution and mass sales of more durable items have not been achieved.

Only sewing machines had wide distribution at one time. Radio, however, came closer than any other product to market saturation because it started on the principle that the buyer could pay as he used.

The answers to why markets are glutted with goods while millions need the products are (1) guaranteed annual wages and (2) a broader distribution of purchasing power through taxation and redistribution. These social moves come slowly and are not sufficient alone. Consumer credit can multiply the cash market many times and open doors to salesmen which formerly were closed. Consumer credit is inevitable.

I. Introduction

There is no need to tell the oft-repeated story of how new vistas and new horizons lie before the ceramic industry. The seven-league strides it has taken in making its tremendous contribution to the war effort have but accelerated the outstanding progress it was making in the last peacetime years. There seems to be almost no limit to the fields of merchandise which its recent inventions and developments put it in a position to invade. Brightness, lightness, durability, and greater utility are all features which a discriminating, though market-hungry, public will demand. The ceramic industry can offer all of these in greater measure than the world has heretofore known. This prolonged period in which its products have been scarce on the shelves in the market place has allowed it to take stock, to envision, to plan so that those horizons of volume, and sales, and profits which once seemed so distant and unattainable are now brought within reach, as the airplane has brought once-distant and unattainable horizons within the geographic reach of the traveler.

There is no need to dwell upon this. Its truth is generally accepted. But there *is* need to dwell upon the means by which the ceramic industry will implement these great possibilities. There is need to pause and to remember that in business, as in the story of man himself, there is no clean cleavage which separates one era from another, no period ever so new and different that the lessons of the past can be neglected or forgotten. That will be just as true when the guns are silenced this time and we embark upon the "age of the common man," or "era of good neighborliness among nations," or "the period of fruition of the world socialist revolution," or whatever the leanings of one's mind may impel him to call this coming time in which commerce can again recover and catch up; this breathing spell before the beast in us makes us take up cudgels again.

The ceramic industry must be particularly cautious lest it be blinded by the expanse of its promised markets, by the natural impatience to give the world the benefit of its great contributions. It must not be blinded to the lessons of the past and the necessity of moving forward within the framework of a careful plan to insure against the interruption of its work and enthusiasm. It must evaluate its fellow travelers along this business road that lies ahead. It must give them elbow room, know something about where they are going, learn how mutual interest and assistance can speed all toward the goal.

II. Consumer Credit

One of the fellow travelers the ceramic industry will have is little older than the new concept of ceramics as an industry, not as old as the century; and, like it, but recently recognized as a powerful factor in any national economy toward which we may look and plan. Yet it has moved triumphantly forward through wars and depressions, industrial and social change. It has seen great industries rise and wane. It has had a finger on the pulse of the masses and held out a helping hand in the struggle of those masses to improve their standard of living. It has made possible the popularization and general acceptance of expensive products not once within their reach. By this popularization it has contributed to continually decreasing costs of production and resultant enjoyment. Conversely, where it has not been present and intelligently utilized, mass distribution and mass sales of more durable items have not been achieved. The writer refers, of course, to Consumer Credit.

We have only to glance back within the memories of most of us to find proof of that contention. In the dying days of the old century, only one manufactured article had really wide distribution. That was the sewing machine. It pioneered the field we now know as sales finance. Everyone wanted a shiny buggy and a high-stepping horse as much as the people of the twenties wanted automobiles; yet the former failed of mass distribution and the latter succeeded because it utilized consumer credit. The radio came closer than any other product to market saturation, largely because it started right off on the principle that the buyer could pay as he used.

The American manufacturer can produce all that the market can absorb. Frequently he has produced more than it would absorb. Thus he was forced to close down and the country was plunged into depression and bankruptcy. This historic bottleneck simply did not make

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† President, Morris Plan Bankers Association, and Trustee, Consumer Banking Institute.

sense when there were literally millions of families who wanted and needed his products. It did not make sense, yet it existed. Why? Simply because the means of broadening the potential market were either not at hand or not understood and properly utilized.

There are a number of possible answers or partial answers, e.g., the guaranteed annual wage and a broader distribution of purchasing power through taxation and redistribution. They are described as social moves and come slowly. But they alone are not sufficient. Neither do they come quickly enough to answer the problem of the poised manufacturer of today. But proved, improved, intelligent use of consumer credit is at hand to multiply the cash market many times, open doors to the salesman which might have otherwise remained forever closed.

An industry with its eye on new markets, an industry with its plans laid for new and relatively expensive products, an industry with a huge stake in the avoidance of distributive bottlenecks which will slow its wheels to a standstill would do well to pause long enough to examine the potentials of consumer credit and the ways in which it can be used to speed and maintain the realization of objectives.

In the postwar economy a greatly expanded use of consumer credit is inevitable.

Two facts seem to be generally accepted: (1) We shall have a national debt of approximately 300 billion dollars and (2) will require a national income of about 135 billion dollars per annum, maintained for quite a number of years to come.

Obviously, if we are to realize a 135-billion-dollar national income without inflation, production must reach astounding levels. Consumer credit played no small part in making high wartime production possible. It will be needed in peacetime.

Someone has said that it is an economic axiom that when capital credit is easy and consumer credit is difficult, the channels of distribution will be clogged with unmarketable goods and a business recession will be upon us.

Consumer credit thus becomes a "must" to the manufacturer who can no longer content himself with the production of goods. He must be vitally interested in distribution and end-usage.

III. Consumer Credit Raises Living Standards

Through the teaming of maximum purchasing power with maximum production power we make possible sustained employment. Thus the standard of living is improved. Thus families will acquire large, costly consumer durables long before they can otherwise be obtained and with a resultant lowering of prices. All of these things make consumer credit a "must."

IV. Consumer Credit Essential for Sound Money

One of the features of the war conditions has been the tremendous shift from private to public credit. In 1930 private debt was estimated at 141.8 billion dollars, whereas Government debt was only 30.1 billion dollars. By 1943, private debt had come down from 141.8 to 111.7 billion dollars, but Government debt had gone up from its 30.1 billion to 161.8 billion dollars. The past year, for which figures are not available, was a continuation with accentuation. Does it not follow that, if this was an outstanding feature of the war conversion, reconversion must contemplate a reversal, at least in large part, of the shift from private credit? This means that return to anything approximating a healthy economy must envision a swing back to private credit, of which consumer credit is an important segment. Figures at the end of 1943 are modest by comparison to what they will be at the war end but, if at the end of that year private debt had borne the same proportion of the total debt which it bore in 1930, it would have amounted to 225.6 billion dollars. And, had the ratio been maintained, the approximately 10 billion dollars of consumer credit outstanding at the end of 1941 would have reached 15 billion dollars by the end of 1943. Hence, as a sequitur, it seems that consumer credit increase is a reconversion "must."

The war is taking the Federal Government up to a debt level of 300 billion dollars, represented in large part by pent-up buying power in the form of bank deposits, cash in circulation, and Government bonds, many of which are payable on demand. All of the elements of inflation and resultant Government default in everything but technical phraseology are here. This is neither the time nor the place to go into the relative inflationary influence which is likely to be exerted by each of these three types of pent-up buying power. It shall suffice, and it is self-evident, that unless some restraints are placed upon it the lid will blow off. It is equally self-evident that, if this potential were not overhanging the markets and if demand were going to be limited by the amount of postwar payrolls and the anticipatory purchasing power which consumer credit could give to them alone, there would be no such threat to well-being and stability. The Government has a very real interest in preventing a mass call upon it for redemption of bonds, and we all have a vital interest in keeping this backlog of buying power from flooding the market. Is it not reasonable to assume that efforts should and will be made to sell the public on the idea of keeping its wartime reserves as rainy-day reserves and using income as the basis of satisfying wants? And does it not follow that the acceptance of any such philosophy gives promise of greater reliance upon and greater volume for consumer credit? In short, is not consumer credit a "must" at the Government solvency and the sound money level too?

V. Retail Trade Needs Consumer Credit

Consumer credit and the consumer credit banker is a "must" to the retail merchant. Since it is more of a "must" to the retailer than it has ever been before, and since he too is heading for new highs in this expanded economy of the morrow, it is here that we find one of the really staggering fields of promise to consumer banking. Let us start at the figures of the Internal Revenue Bureau[1] for the year 1940. These are based on figures for the totals of the retail mercantile and retail fields. In 1940, these trades reported the following percentages to their total capital, surplus, undivided profits, and surplus reserves: receivables (goods sold on credit) 35.57%; inventory 34.79%; cash and Government bonds 15.23%. The remaining 15% of net worth was scattered through other items which we need not consider. Naturally *we* are

[1] U. S. Treasury Statistics of Income for 1940, Part 2, pp. 110 and 116.

prone to focus our attention on receivables, for it is these which can be readily diverted into earning assets for consumer bankers under one of the many plans which we have been successfully evolving over the years. Because of that interest it should be added that these figures are net or minus reserves. That was in 1940. It can be taken for granted that, with taxes and labor costs being what they are and have been, there has been no substantial addition to capital liabilities in these fields. In 1940, the total national income was 77,574,000,000 dollars.[2] That figure must be multiplied by 1.74 to get the national income of 135 billion dollars which we must have in the future. If we ignore all of the reasons for an increased use of credit which have been given previously, get really conservative, and assume that only the prewar pattern will be maintained, that would mean that all these concerns will have to do 1.74 times as much business as they did in 1940 and carry 1.74 times as much in receivables. With static capital, this means that receivables will jump to 61.98% of capital and if all of the cash and all of the governments of 1940 are thrown into the gap they only bring the percentage up to 50.8%. But that is not all; it likewise follows that inventory will have to bounce up to 53.46%. There is every reason to believe that inventory must go up at an even greater than proportionate rate for the margin of profit is to be narrower and hence more business must be turned and more inventory maintained to offset that little change. We have only to follow the unfolding of the social pressures under which the price of goods is pegged while wages are allowed to go up to tell what will happen to the margin of profit and who will pay the freight.

Be that as it may, if the sum of inventory and receivables exceeds the total capital without making any allowance for operating funds and the items covered in the miscellaneous 15% referred to, it takes no mathematician to see that the merchants must either turn to the banks to finance a greatly increased part of their receivables or to the capital markets for more capital. We believe they are going to prefer the former as more in step with modern trends and their own long-range financial needs.

VI. Summary

The tremendous increase in consumer credit is an absolute essential unless the future of the country is to take a direction which no qualified student has forecast. It is an essential because (1) goods production, job production, and social aims will be abetted through the instrumentality of consumer credit as the chief solution to the stifling bottleneck historically occurring at the demand or distribution level; (2) if reconversion is to reverse the process of the conversion movement, the use of private credit, of which consumer credit is an important segment, must be a feature; (3) inflation control and Government solvency can be served by dependence on consumer credit; (4) the retail distributor no longer has adequate capital to be his own consumer credit carrier, any more than he has sufficient capital to keep him out of the banks the year around for his commercial loan needs, nor is there further reason for him to be both a lender and a vendor.

The foregoing reasons for belief in a greatly expanded consumer credit potential do not include the more obvious and oft-repeated ones. Among these are the greatly increased number of banking outlets newly awakened to the importance of the installment buyer and borrower; the obsolescence of and hunger for consumer durables; the fascinating prospect of new gadgets, new techniques, new color combinations, and new lines; the greatly enhanced elasticity of consumer credit itself and its reduced cost. Related to consumer credit, these are tremendously promising in themselves, but they have not been expanded upon here because they have been so frequently and widely discussed.

To the ceramic industry, about to embark into what may be reasonably called a "commercial promised land," this all adds up to one thing. One of its fellow travelers will be that segment of finance we call CONSUMER CREDIT. It will be a worthy fellow traveler to such a great and promising industry. Like the ceramic industry it will be growing rapidly, exploring every means of contributing to a higher standard of living for the masses. Consumer credit can open doors, and a mutual relationship, based on understanding and mutual dependence, can make the road easier and the trip more speedy.

1025 CONNECTICUT AVENUE, N. W.
WASHINGTON 6, D. C.

[2] World Almanac, 1945, p. 519.

IS YOUR LABORATORY LISTED IN DIRECTORY OF RESEARCH LABORATORIES?

The eighth edition of the National Research Council directory, Industrial Research Laboratories in the United States, is now being compiled. The seventh edition appeared in 1940 and contained information concerning the industrial research laboratories of 2264 companies and their subsidiaries. With five years intervening between the editions, there undoubtedly will be a number of changes and it is hoped that a number of new laboratories will be added.

Although an effort was made in 1940 to reach as large a number of laboratories as possible, no doubt some in each field have been inadvertently omitted. It is important that contact be made with these laboratories in compiling the forthcoming edition.

The term "research" for the purpose of the directory is construed as including investigations looking toward the improvement of products or the reduction of cost of manufacture as well as fundamental research and applied research. It does not apply to laboratories concerned only with commercial testing.

Research men should ask directors of their laboratories whether questionnaires have been received, as those reporting in 1940 will have had their printed statements sent for revision. If no questionnaire has been received, one will be sent upon request to the Library, National Research Council, 2101 Constitution Ave., Washington 25, D. C.

The directory is issued by the National Research Council with no expectation of profit. There is no charge for the inclusion of a statement regarding a laboratory in the publication and no obligation is incurred in furnishing data.

ELECTRONIC FEEDER CONTROL

Electronic feeder control to regulate the load of pulverizing equipment has been announced by the Mosher Electronic Controls, New York, N. Y. These controls automatically regulate the load on mills to the full operating capacity of the motor drive. The faults of manual regulation are avoided and large increases in production are promised.

INSTITUTE OF CERAMIC ENGINEERS

Executive Committee, 1945–1946

President: T. A. KLINEFELTER, Southern Experiment Station, U. S. Bureau of Mines, Tuscaloosa, Ala.
Vice-President: C. M. DODD, Iowa State College, Ames, Iowa.
Secretary: ROBERT TWELLS, Electric Auto-Lite Co., Spark Plug Div., Fostoria, Ohio.
Past-President: M. F. BEECHER, Norton Co., Worcester, Mass.
Trustee Representative: H. M. KRANER, Bethlehem Steel Co., Bethlehem, Pa.

MINUTES OF BUFFALO MEETING

The meeting of the Officers and Committeemen of the Institute of Ceramic Engineers at the Hotel Statler, Buffalo, N. Y., was called to order at 10:00 A.M., April 16, 1945, by President Beecher.

E. P. McNamara was elected Secretary pro tem in the absence of Secretary Bradley, who arrived after the start of the meeting.

The motion was made by C. M. Dodd and seconded by Robert Twells to pass the minutes of the last meeting and accept them as published (see *Bull. Amer. Ceram. Soc.*, **23** [9] 305–306 (1944)).

(1) Report of President

A report by President Beecher covered the economic status of ceramic engineers and the content of engineering curriculum was presented and accepted. (This report was published in *Bull. Amer. Ceram. Soc.*, **24** [7] 272–73 (1945)).

(2) Committee on Rules

A report written by Chairman P. G. Herold was read by the Secretary. Following considerable discussion from the floor, a motion was made by R. L. Stone and seconded by F. C. Flint that the report be referred back to the Committee. The motion failed to pass when it was voted on. A motion by J. W. Whittemore and seconded by C. M. Lambe that the Rules be adopted as recommended was passed.

(3) Committee on Engineers' Council for Professional Development

The report of this Committee was not received from Chairman Greaves-Walker in time to be read at the meeting.

(4) Committee on Membership and Examinations

The report of this Committee was made by Chairman Watts and was accepted on a motion made by J. R. Beam and seconded by C. M. Lambe.

(5) Committee on State Boards of Engineering Examiners

This report by Chairman Greaves-Walker was not received in time to be read at the meeting.

(6) Committee on Professional Status and Development

This report by Chairman Dodd was approved on a motion made by H. M. Kraner and seconded by H. B. DuBois.

(7) Committee on Education

Chairman Beam reported on the activities of this Committee. His report was accepted following a motion by H. M. Kraner, which was seconded by C. M. Lambe. Chairman Beam has not as yet furnished a written report.

(8) Committee on Classification and Nomenclature

Chairman Spencer-Strong made a report on this Committee. His report was accepted following a motion made by C. M. Dodd and seconded by A. I. Andrews. Chairman Spencer-Strong has not as yet furnished a written report.

T. A. Klinefelter, President, 1945-1946

(9) Committee on Engineering Progress

A report on this Committee made by Chairman McNamara was accepted following a motion made by H. M. Kraner, which was seconded by C. M. Lambe.

(10) Report of Secretary-Treasurer

The report of Secretary-Treasurer Bradley was approved by a motion made by E. P. McNamara and seconded by C. M. Lambe.

A motion was made by J. R. Beam that the Institute should prepare a descriptive folder covering ceramic engineering to be edited by The American Ceramic Society and to include a message from the President of the Institute containing information on professional engineering ethics and a message from the different ceramic schools. The motion was seconded by C. M. Lambe and carried.

A motion was made by Robert Twells to amend the By-Laws to the effect that the dues for members of the Institute of Ceramic Engineers in the armed forces will be waived for the entire time the members are in the armed forces, and to the effect that credit will be given on future dues in case of the members having paid dues during the time they were in the armed forces. The motion was seconded by E. P. McNamara and carried.

—R. S. BRADLEY, *Secretary*

Reports of the foregoing Committees and the Treasurer's report follow herewith, with the exception of the Committee on Education and Committee on Classification and Nomenclature, which will be published at a later date. The President's report, as previously noted, was published in an earlier issue of The Bulletin.

REPORT OF COMMITTEE ON RULES

Article EIR VII. Nominations and Elections*

(1) The Executive Nominating Committee of THE INSTITUTE shall consist of the five (5) most recent past-presidents who are members in good standing, with the senior past-president acting as Chairman, which shall nominate one (1) candidate for the office of President and two (2) candidates for each of the offices of Vice-President and Secretary-Treasurer.

(2) The Executive Nominating Committee shall submit to the President of THE INSTITUTE a list of the candidates together with their acceptances at least ninety (90) days prior to the Annual Meeting of THE SOCIETY.

(3) Any group of fifteen (15) voting members of THE INSTITUTE may constitute themselves a nominating committee by forwarding to the President of THE INSTITUTE the names of their nominee or nominees over their signatures together with his or their acceptance at least ninety (90) days prior to the Annual Meeting of THE SOCIETY.

(4) The Executive Nominating Committee shall nominate one or more candidates for Trustee representative of THE INSTITUTE prior to the Annual Meeting of THE SOCIETY at which the triennial term of the Trustee representative of THE INSTITUTE expires and forward his or their names together with his or their acceptance in writing to the President of THE INSTITUTE at least ninety (90) days prior to the said Annual Meeting.

(5) The President of THE INSTITUTE shall transmit all nominations to the General Secretary of THE SOCIETY ninety (90) days prior to the Annual Meeting, who shall place the nominations on THE SOCIETY ballot for that year.

(6) (*a*) Same as present By-Law 5(*a*).
(*b*) Same as present By-Law 5(*b*).

—P. G. HEROLD, *Chairman*

* Revision of Institute of Ceramic Engineers' Rules given in *Bull. Amer. Ceram. Soc.*, **22** [7] 252 (1943).

REPORT OF COMMITTEE ON ENGINEERS' COUNCIL FOR PROFESSIONAL DEVELOPMENT

The Council met in New York October 20, 1944, and received reports from the various committees.

Of interest to the Institute was another report on admission of our organization to membership in the Council. As in previous reports on this subject, the committee appointed to consider it advised against admission. President Lee wrote a nice letter to your Chairman advising of the committee's action and stating that he hoped some means could be found for our admission in the future.

The Committee on Guidance and Measurement of Students reported that nearly 5000 engineering students were being tested in 1944 and that results were promising.

The Committee on Engineering Schools reported that all departments of engineering would be re-examined for accrediting after the war. In this connection, your Chairman discussed with members of the Council the question of using some "standard of measurement" in the accrediting of departments of ceramic engineering. The examining committees have stated that they were at a loss to determine what the field of ceramic engineering covered, the subjects that should be covered, and the weights to be assigned to each subject. This referred particularly to the basic sciences and basic engineering subjects.

To provide the examining committees and our own representatives on these committees with a "yardstick" which can be used when the reaccrediting of the departments is undertaken, your Committee strongly recommends that the Institute and Ceramic Educational Council appoint a joint committee to determine *minimum* curriculum requirements in chemistry, mathematics, physics, physical chemistry, mechanics, strength of materials, and engineering drawing and design. This committee should also decide whether to require courses in surveying, thermodynamics and elements of electrical engineering and whether a thesis should be required for graduation.

It is not suggested that curricula be standardized, but, in order that the examining committees may have a guide, it appears absolutely necessary to provide them with minimum requirements for the degree in ceramic engineering. It is of interest to note that the American Institute of Chemical Engineers has an accrediting committee of its own and the E.C.P.D. will not accredit a department of chemical engineering unless this committee gives it a "green light." As other engineering societies are considering setting up such committees, should not the Institute give the matter consideration?

If the recommendation of the Committee that a joint committee be appointed is approved, it is further recommended that the membership be made one half of educators and one half of representatives of the ceramic industries. The examining committees of E.C.P.D. are made up in approximately these proportions.

The Committee on Technical Institutes recommended that E.C.P.D. undertake to accredit these schools and the recommendation was adopted. This will tend to raise the present standards.

The Committee on Engineering Ethics was still attempting to have the member engineering societies agree on the proposed Canon of Ethics.

The Committee on Employment Conditions for Engineers reported that the engineering societies were still struggling with the problem of securing separate representation for engineers before the War Labor Board. The present situation is very much confused due apparently to the inability of the engineering societies to get together.

The E.C.P.D. requested that all engineering societies, whether members of the Council or not, give all the help possible in promoting the spirit of professionalism among young engineers. It was strongly recommended that educators do all possible to develop professional-mindedness among engineering students and that the branches, chapters, and sections of the societies continue the effort when the young graduates come into their hands.

—A. F. GREAVES-WALKER, *Chairman;*
J. W. WHITTEMORE, AND C. M. DODD

REPORT OF COMMITTEE ON MEMBERSHIP AND EXAMINATIONS

Applications received and examined	32
Recommended for Member Grade	3
Recommended for Associate Grade	3
Recommended for Junior Grade	24
Rejected as ineligible	2
	32

—ARTHUR S. WATTS, *Chairman*

REPORT OF COMMITTEE ON STATE BOARDS OF ENGINEERING EXAMINERS

The annual meeting of the S.B.E.E. was held in Lexington, Ky., October 30–31, 1944.

The topic that was most discussed at the meeting was the action of the Supreme Court of Illinois in declaring unconstitutional the registration law for engineers and architects which went into effect January 1, 1944. In effect, the Court stated that the definition of a professional engineer used in the law did not define and that the board was clothed with legislative powers under the law.

Although the registration laws in other states have been passed on by the courts, this was the first instance in which one of them had been found unconstitutional.

The engineers of Illinois are rewriting those parts of the original law with which the Court found fault and will attempt to have a new law passed by the next legislature.

A great deal of the discussion was directed toward developing a definition of professional engineering that would be "watertight," as it was feared definitions similar to the one used in the Illinois law might be attacked in other states. A committee was appointed to consider the matter and present a new definition for the Model Law.

It appeared that practically all State Boards were planning to certify engineering graduates as "Engineers-in-Training." In some states, the legislatures will have to amend the laws, whereas in others the boards can provide for such certification. Certification may have some effect on the efforts of labor unions to compel young engineers to join and will, without doubt, make them more professionally minded.

Some boards have decided to certify on the strength of the applicant having received a degree in engineering, whereas others will require passing a comprehensive examination.

The small financial contribution of the Institute was gratefully received and acknowledged. It is recommended that the Institute's contribution in 1945 be not less than $200.

The question of what constituted "qualifying experience" received considerable attention, but no agreement on the question was reached. Each board may continue to decide how much and what kind of experience an applicant must have to receive a license.

The Subcommittee on Written Examinations reported that (1) the consensus of opinion of member boards favored written examinations, (2) the examination should be of sufficient length to require at least one day of eight hours for completion, and (3) examinations should emphasize such subjects as mathematics, physics, and mechanics and should include problems of a practical nature and also descriptive processing.

—A. F. GREAVES-WALKER, *Chairman*

REPORT OF COMMITTEE ON PROFESSIONAL STATUS AND DEVELOPMENT

(1) Code of Ethics

The professions of law and medicine both have professional codes of ethics to which they adhere quite rigidly. Engineers as professional men, if they are to have the respect of the public, must be guided in their dealings by certain ethical standards. At the Eleventh Annual Meeting of the Engineers' Council for Professional Development, the Committee on Engineering Ethics presented "The Faith of the Engineer," which was adopted by the meeting. Several of the Engineering Founders Societies have also given this code their stamp of approval. We present it here for your consideration and future adoption.

The Faith of the Engineer

I am an Engineer. In my profession I take deep pride, but without vainglory; to it I owe solemn obligations that I am eager to fulfill.

As an Engineer, I will participate in none but honest enterprise. To him that has engaged my services, as employer or client, I will give the utmost of performance and fidelity.

When needed, my skill and knowledge shall be given without reservation for the public good. From special capacity springs the obligation to use it well in the service of humanity; and I accept the challenge that this implies.

Jealous of the high repute of my calling, I will strive to protect the interests and the good name of any engineer that I know to be deserving; but I will not shrink, should duty dictate, from disclosing the truth regarding anyone that, by unscrupulous act, has shown himself unworthy of the profession.

Since the Age of Stone, human progress has been conditioned by the genius of my professional forebears. By them have been rendered usable to mankind Nature's vast resources of material and energy. By them have been vitalized and turned to practical account the principles of science and the revelations of technology. Except for this heritage of accumulated experience, my efforts would be feeble. I dedicate myself to the dissemination of engineering knowledge, and, especially, to the instruction of younger members of my profession in all its arts and traditions.

To my fellows I pledge, in the same full measure I ask of them, integrity and fair dealing, tolerance and respect, and devotion to the standards and the dignity of our professions; with the consciousness, always, that our special expertness carries with it the obligation to serve humanity with complete sincerity.

(2) Collective Bargaining

This subject was brought to your attention last year by the Chairman of the Committee on Professional Status and Development (p. 307, September, 1944, *Bulletin*). The present Chairman has spent considerable time reviewing this problem and has found that the most concise statement of the situation is the following summary published in *Iowa State College Alumnus*, November, 1944, by L. O. Stewart, Head, Civil Engineering Department.

Collective Bargaining Affects the Professional Engineer

The following brief account of developments in the field of collective bargaining as they have affected professional men may prove interesting to those readers who have not kept up with happenings in this field.

The National Labor Relations act gives and upholds the right of employees to bargain collectively. It says: "Employees shall have the right to self-organization, to form, join, or assist labor organizations, to bargain collectively through representatives of their own choosing, and to engage in concerted activities for the purpose of collective bargaining or for mutual aid or protection."

The administration of the act can be summed up in two simple subjects, as follows:

(1) The Labor Board upon petition can hold elections to discover worker choice of representatives within an appropriate bargaining unit.

(2) The Labor Board, upon filing of charges, may investigate, and, if charges are substantiated by evidence, may order employees to cease and desist from any of five specified unfair labor practices, which are: (*a*) an employer must not interfere with employees who wish to join together for bargaining purposes, (*b*) an employer must not dominate such a group of employees, (*c*) an employer must not discriminate against employees for giving testimony at an NLRB hearing, (*d*) an employer must not discriminate against employees for group activities, and (*e*) an employer must not refuse to bargain with his employees in good faith.

Under the law as interpreted professional men, such as engineers and chemists, must comply with the demands for collective bargaining within a specified group. It has been suggested that the law be rewritten to exempt professional men from its provisions. The engineers of Canada are now working on some pioneer legislation which would (*a*) define the field of the persons included, and in some may stipulate that technical societies at their own volition will have the power to conduct collective-bargaining negotiations for the professional engineering employees. One clause under consideration is that nothing in the proposed legislation will take from the engineer his right to join a labor union if he so desires, and provided, of course, that the union will accept him. Another clause considered is that persons covered by this will agree not to go on strike.

The two larger labor unions have set up affiliates for technical men as follows: For the CIO the FAECT, meaning Federation of Architects, Engineers, Chemists, and Technicians; for the AF of L the IFTEA and DU, meaning International Federation of Tech-

nicians, Engineers, Architects, and Draftsmen's Union.

The following typical cases will illustrate how collective bargaining operates.

(1) In company A about 500 men are employed in the engineering department, of whom more than 300 would be considered professional engineering employees. In this group there are three receiving $7000 per year, four are receiving between $6000 and $7000, seven are receiving between $5000 and $6000, while the remainder are receiving between $3600 and $5000 per year. At the NLRB election, 420 votes were cast, 222 being for representation by FAECT and 198 against such representation. Thus, all grades of professional men became members of FAECT.

(2) In company B the professional engineering employees objected to inclusion in a group composed of both professional and nonprofessional employees. This professional group composed of 322 men formed a committee of Professional Engineering Employees; raised money among themselves; hired legal counsel and intervened in a hearing before NLRB. The Shell Development case was cited as precedent and NLRB granted the professional employees the right to a separate election. As a result, out of 322 professional engineering employees eligible to vote, 102 voted for representation by FAECT whereas 184 voted against such representation, and out of 536 subprofessional engineering employees eligible to vote, 298 voted for representation by FAECT and 132 voted against such representation. Thus, the professional engineers were able to keep out of the CIO union.

(3) In two other cases the outcome of elections was different from that cited in company B. In these cases the professional employees petitioned NLRB for separate elections and their requests were granted. Nevertheless, the professional engineering employees in these plants chose to be represented by FAECT along with the subprofessional employees.

The Shell Development case was important because it has become a precedent for later cases. This controversy was submitted to NLRB on petition of FAECT to set up a bargaining unit composed of both professional and nonprofessional employees. The hearing was held in San Francisco October 27, 1941. At the beginning, a group of professional employees of the Shell Development Company filed a motion to intervene in the proceedings. Each of the professional employees was a chemist employed in professional work of a highly confidential nature. They presented evidence to show why they should not be included in a collective-bargaining group which consisted of a heterogeneous group of unskilled and skilled laborers and professional employees. In its decision the NLRB stated: "Upon the entire record we find that the professional employees might properly be considered either as a separate unit or as a part of a larger unit composed of professional and nonprofessional employees. Under such circumstances, we apply the principle that the determining factor is the desire of the professional employee. We shall therefore direct separate elections in order that we may ascertain the wishes of the professional employee."

Thus we have established clearly the general policy that professional employees cannot be forced into a heterogeneous bargaining group set up by a labor union in its negotiations with an employer unless a majority of professional employees, through a vote confined to a professional employee group, expresses its desire to be included. Also, we have established the principle that professional men of various kinds, such as engineers and chemists, can band together in one group, the important and significant thing being that they are all professional employees.

Let us summarize the important points to be kept in mind by one who is interested. They are as follows:

(1) An individual professional man cannot avoid the implications of collective bargaining if there is a call for an election where he works.

(2) He may wish to become a member of the union that wins the election. Practically all contracts require that everyone affected shall become a member of the winning group.

(3) He may prefer to help organize the professional employees and ask the NLRB for separate recognition.

(4) If there is to be separate action by a group of professional employees there must be a definition of professional employee and a separation of the employees into two groups, professional and nonprofessional.

(5) There must be a clear separation of employer and employee. This is fundamental in all collective bargaining. Our professional societies are unable to bargain because their membership includes both employers and employees.

In the Wage-Hour law, a professional employee has been defined as one who must (1) earn a salary of not less than $200 per month, (2) be engaged predominantly in intellectual work, varied in character, (3) be required to exercise constant discretion and judgment, (4) be engaged in work of such a character that the output cannot be standardized, (5) spend no more than 20 per cent of his time doing nonexempt work, and (6) must be engaged either in work that requires advanced knowledge normally acquired by a prolonged course of specialized study or in work that is predominantly creative and original in character.

The American Society of Civil Engineers has prepared a comprehensive definition, which is as follows:

"The designation 'Professional Employees,' used in the sense that persons capable of being so designated may join with others similarly capable of being so designated for the purposes of collective bargaining separately from any other group composed of persons not capable of being so designated, shall be that of only those who, excepting employees or those to whom employers may have delegated managerial responsibility with respect to employment conditions, possessing an intimate knowledge of mathematics and physical sciences, gained by technological and scientific education, training, and experience, and in a position of trust and responsibility apply their knowledge in controlling and converting forces and materials to use in structures, machines, and products, and whose work requires the exercise of discretion and judgment, is creative and original and of such character that the output cannot be standardized; and those who, without the experience set forth, but having been graduated from an approved educational institution and having received the degree of Bachelor of Science or its equivalent, in Engineering, are engaged in Engineering work."

The one thing that the foregoing article brings to our attention is that professional employees cannot be forced into a bargaining group unless by majority vote that expresses a desire to be included. The thing that should be remembered is that professional men of various kinds, such as engineers and chemists, can band together in one group.

More than a year ago, the Tennessee Association of Professional Engineer Employees was formed. Soon after their formation, a group of their members proposed that TAPEE act as the bargaining group, and the NLRB took the matter under advisement. The *Tennessee Valley Engineer* for February, 1945, reports as follows:

> The War Labor Board has not seen fit to dispose of our case as yet, so we have nothing to report on it at this time. A notice in one of the papers the other day quoted one of the members as saying they had several months of disputes ahead of them. Maybe we shall have a decision this next month.

In lieu of anything positive about the benefits of TAPEE, below are two cases showing what *did* happen in offices where the professional engineering employees were members of one of the labor organizations:

CASE 1. A labor union representative warned a professional engineer who was checking the drawings and was responsible for the accuracy of such drawings not to find too many errors since such action would affect the status of the draftsman, with the result that this engineer, a family man with children, corrected no more than 10 or 15 errors on any drawing and passed the drawings still containing 30 to 50 errors.

CASE 2. A licensed professional engineer, full member of the Society, was in charge of 15 engineers checking drawings prepared by over 200 draftsmen. Among the draftsmen was one who submitted drawings on which between 60 and 97 errors were regularly found. In private discussion with a union member, the engineer was made to understand that everyone has the right to a living—even a draftsman making 97 mistakes on one drawing—and therefore no complaints should be made. The engineer complained and was forced to resign "for lack of understanding and cooperation."

The easiest way to get yourself into such a position is to stick your head in the sand and say, "It can't happen to me."

Although it seems inadvisable for the Institute of Ceramic Engineers to set up their own local bargaining agencies, those members who might be affected by collective bargaining should have a "foxhole" into which to jump when the necessity arises. It would be wise, therefore, for each one to investigate the possibility of his joining some group of engineers already established as a bargaining agency if he wishes to uphold the dignity of the profession and be prepared when the labor unions threaten to engulf him.

(3) Engineering Education

The Report of the Society for the Promotion of Engineering Education Committee on Engineering Education after the War, published in the May, 1944, *Journal of Engineering Education*, makes specific recommendations as to what an engineering college curriculum should attempt to accomplish. One of the recommendations is that 20% of an engineering curriculum be devoted to a designed sequence of humanistic-social subjects extending throughout the four undergraduate years. The committee emphasizes the point that a three-hour course in English during the freshman year is not sufficient to develop the humanistic-social side of a well-rounded professional engineer who can take his place in society with other professional men and not feel that his education has been neglected in this sphere. This idea may eventually lead to the five-year engineering course.

Your Committee recommends that every educator in the field of ceramic engineering study the S.P.E.E. committee report and include as many of that committee's suggestions as possible in the curricula for postwar ceramic engineering education. If the ceramic engineer of the future is to hold the esteem of engineers in the other fields of the profession, consideration of an action on this point must not be neglected.

(4) Student Branches

Engineering students take pride in being engineers. The American Ceramic Society does have Student Branches in the recognized educational institutions where ceramic engineering is taught, but this does not fill the need for a strictly engineering organization. The Institute of Ceramic Engineers should give thought to the matter of how best to establish student branches in the engineering colleges.

(5) Student Recruiting

Without new members this Institute could not continue its existence. Unless the colleges graduate ceramic engineers the crop of new members will be small. To graduate engineers the colleges must have recruits from the high schools. Each of us can promote ceramic engineering if we will take the time to talk to the outstanding seniors in the home-town high school. There is something alluring about ceramic engineering if it is presented to the youngster in the proper way.

(6) Salary and Job Classification

A questionnaire will be distributed to the members of the Institute soon; when completed and returned, this questionnaire should furnish enough information to permit a thorough study of the salary situation within the ranks of the ceramic engineers. It should also furnish a comparison of the financial accomplishment of our branch of engineering with that of the other branches. The main objective, however, is to establish some criterion which may be used as a salary guide by anyone who wishes to employ a ceramic engineer for certain grades of professional work.

When the salary limits for the various grades are once established, these can be easily revised upward or downward as the economic conditions of the industry warrant by merely applying a percentage factor.

(7) Inter-Society Contacts

The officers of the Institute for some years have felt that contact with other engineering societies is important to the advancement of the Institute of Ceramic Engineers. Through the efforts of Dr. Greaves-Walker, such activities have gained recognition of ceramic engineering by the State Boards of Engineering Examiners and the appointment of ceramic engineers to the inspection boards of the Committee on Engineering Schools of the Engineers' Council for Professional Development.

At the request of President Beecher, the Chairman of the Committee on Professional Status and Development applied for associate membership in the American Institute of Electrical Engineers and the American Institute of Chemical Engineers. He has been accepted by both. Before being accepted by these organizations he attended the annual meeting of both Institutes and was well received as the representative of the Institute of Ceramic Engineers. To get acquainted with the leaders in organizations the size of these two Institutes is difficult and will require more than one visit. A substantial number of the keymen in each of these Institutes know, however, that there is such an organization as the Institute of Ceramic Engineers. Eventually, by constant effort applied in the proper pursuits, our Institute of Ceramic Engineers may gain the place among engineering societies that we desire and rightly deserve.

—C. M. DODD, *Chairman*; F. C. FLINT, AND A. F. GREAVES-WALKER

REPORT OF COMMITTEE ON ENGINEERING PROGRESS

(1) Purpose

The Committee was authorized at the annual meeting in April, 1944, to follow and report on new developments in the field of ceramic engineering.

(2) Organization

As a start, it was decided to organize the Committee along the lines of the organization of The American Ceramic Society, i.e., have a Committee with representatives from the White Wares, Glass, Refractories, Enamel, Structural Clay Products, and Materials and Equipment Divisions.

(3) Operation

The representative of each branch will be responsible for following the engineering developments in his own field.

He will prepare a report on these activities, with the assistance of others if necessary, and submit it to the Chairman of the Committee not later than one month before the annual meeting of the Institute. The Chairman will prepare a summary of these reports and present it at the meeting of the Institute. If time is available, some or all of the individual reports may be given orally. If not, the individual reports may be published.

Through its reports and activities, it is hoped that this Committee will serve to focus attention on engineering developments in ceramics and to stimulate greater interest in engineering in the Divisional meetings of The Society.

During the past year, it has not been possible to organize the Committee properly and, therefore, no reports are presented at this time. The following members have agreed to serve as representatives of the various branches: R. E. Birch, Refractories; R. E. Gould, White Wares; R. L. Fellows, Enamel; L. R. Whitaker, Structural Clay Products; L. H. Berkelhamer, Raw Materials; no representative for Glass.

It was felt that a representative for ceramic equipment was unnecessary as most engineering developments in any particular branch would be peculiar to that branch and would be covered in the regular report.

(4) Future

After considering the purpose and functions of the Committee for several months, it is the opinion of the Chairman that the Institute should give more consideration to this problem before further development is attempted. Some questions which present themselves are as follows: (1) Should the principal effort of the Committee be compiling and reporting or should it be in stimulating engineering papers in Divisional meetings? (2) Should the members of the Committee be official representatives of the Divisions, appointed by the Chairman of each Division, or should the Institute pick its own Committee? (3) Could the respective members serve as an engineering member on the Program Committee of each industrial Division? (4) Should the Committee attempt to present lengthy reports at the Institute meetings? (5) Should activities be confined strictly to engineering work? (6) Will the proposed work duplicate any other committee already set up?

—E. P. McNAMARA, *Chairman*

REPORT OF SECRETARY-TREASURER

(Year 1944 through March, 1945)

Number of Members

		Resigned		Cut off	
Charter	137	Charter	5	Charter	4
Member	66	Member	2	Member	2
Associate	124	Associate	11	Associate	7
Junior	50	Junior	12	Junior	7
	377		30		20

Deceased		New Members Since March, 1944	
Charter	8	Associate	3
Member	2	Junior	22
	10		25

Unpaid Assessments

Number of members with unpaid assessments for 1945	18
Number of members with unpaid assessments for 1944 and 1945	4
Number of members with unpaid assessments before 1944	2

Assessments of Men in Armed Forces

Number of members in armed forces	49
Number of members in armed forces who paid 1945 dues before being notified of action of Executive Committee	10
Number of members in armed forces with delinquent dues for years before 1945	22

Financial Statement

BALANCE DECEMBER, 1943			$1797.28
RECEIPTS			
1944 Assessments			792.00
DISBURSEMENTS, 1944			
Feb.—	Paper (second sheets)	$ 5.05	
March—	Greaves-Walker, A.I.M.-M.E. Meeting	70.00	
	Subscription, *Professional Engineer*	1.00	
April—	Postage and stenographic service (A. S. Watts)	9.80	
	Post cards (DuBois)	9.00	
May—	Stationery	17.26	
July—	500 reprints "Second Mile"	15.00	
	U. S. Directory of Registered Professional Engineers	15.20	
	Contribution to National Council of State Boards of Engineering Examiners	50.00	
	Greaves - Walker, S.P.-E.E. Meeting	80.59	
Sept.—	Reprints for Greaves-Walker	10.34	
	Photostats for Greaves-Walker	3.45	
Oct.—	Dues: S.P.E.E.	5.00	
Nov.—	Greaves - Walker, E.C.-P.D. and S.P.E.E. Meeting	138.95	
	Greaves - Walker, National Council of State Boards	80.10	
	Printing Membership Cards	2.64	513.38
BALANCE IN BANK DECEMBER 31, 1944			$2075.90
RECEIPTS			
January through March, 1945			634.00
			$2709.90
DISBURSEMENTS, 1945			
Jan.—	C. M. Dodd, American Institute of Chemical Engineers	$ 54.55	
Feb.—	C. M. Dodd, American Institute of Electrical Engineers	113.52	168.07
BALANCE IN BANK MARCH, 1945			$2541.83

—R. S. BRADLEY, *Secretary-Treasurer*

AMERICAN STANDARDS ASSOCIATION

A complete list of the 800 standards of the American Standards Association has been issued. It represents the work of the Association for the past twenty-six years and lists the standards alphabetically by the various engineering fields that are covered. Many of them were developed with the assistance of associations in the field. Copies of the catalog may be obtained direct from the American Standards Association, 70 East 45th St., New York 17, N. Y.

CERAMIC EDUCATIONAL COUNCIL

MINUTES OF ANNUAL MEETING

The annual meeting of the Ceramic Educational Council was held in Buffalo, N. Y., April 16, 1945, the President, Charles M. Dodd, presiding.

The minutes of the 1944 annual meeting, appearing on page 232, *The Bulletin of The American Ceramic Society*, July, 1944, issue, were approved as printed.

Charles M. Dodd presented a President's report in which emphasis was directed toward postwar problems in ceramic education.

The Committee on Rules (R. M. Campbell, Chairman) submitted a proposal to amend Article ECR VII of the Rules of the Ceramic Educational Council concerning Nominations and Elections. By common consent of those present, this proposal was to be circulated among the membership of the Council for approval.

The Committee on Ceramic Curricula and Course Content (C. R. Amberg, Chairman) presented certain recommendations to the Council, based upon a critical review of and commentary on the S.P.E.E. report on "Engineering Education after the War."

The Report of the Committee on Physical Chemistry (A. E. Badger, Chairman) was essentially the same as submitted in 1944.

The report of the Committee on Classification and Nomenclature (A. S. Watts, Chairman) coincides with that of the General Committee on Classification and Nomenclature for The Society, of which M. F. Beecher is Chairman.

The Committee on Statistics (E. C. Henry, Chairman) presented information relative to the critically downward trend in the number of students with ceramic training graduating in recent years from eight ceramic schools.

The Committee on Handbook of Ceramics (S. R. Scholes, Chairman) recommended that the preparation of a Ceramic Handbook be abandoned at this time. Motion to this effect was made, seconded, and carried. The Committee on Competition and Awards (M. E. Holmes, Chairman) reported its decision to discontinue awards until enough ceramic students were available to make this activity worth while. In the meantime, the *Brick and Clay Record—Ceramic Industry* Fund of $1000 is to be held in trust until reactivity begins.

R. M. King, representative on the Committee on Education of The American Ceramic Society, reported no activity of the Committee.

A motion was made, seconded, and carried to write a letter of commendation to the office of the Secretary of The American Ceramic Society for the News Letter sent to members of The American Ceramic Society in the armed forces.

The following Committees did not report: (1) Extension Instruction, Rehabilitation, and Reemployment, (2) Editorial, (3) Membership, and (4) Standards.

The Nominating Committee (R. L. Stone, Chairman) presented the following slate: A. I. ANDREWS for *President;* P. S. DEAR for *Vice-President;* and P. G. HEROLD for *Secretary*. This slate was elected, and the new officers were installed *in absentia* except for President Andrews.

The principal item of general discussion was changes in curricula contemplated or accomplished by various schools to improve teaching of ceramics, to take care of veterans, and to accommodate the recommendations of the Committee on Post War Engineering Education of the E.C.P.D.

—PAUL S. DEAR, *Secretary*

PRESIDENT'S REPORT

Had it been possible to hold a regular meeting this year it would have been the eighth since the establishment

A. I. Andrews, President, 1945-1946

of the Ceramic Educational Council as a Class of The American Ceramic Society. Although this group has stimulated a healthy exchange of ideas among its members and has done much to standardize the curricula in ceramic education and broaden its field of influence, there is still much to be done to develop our educational processes and procedures before we will be able to offer an ideal education in ceramic art, technology, or engineering.

The return of postwar consumer-goods production will cause a demand for ceramic graduates which we will not be able to meet immediately. Such a demand should stimulate enrollment in ceramic courses which the colleges should be prepared to meet with adequate curricula, staff, and equipment.

Many of the ceramic educators have been pursuing activities other than teaching during the war. A return to teaching ceramic subjects will be most welcome, even though some of the teaching methods will of necessity be different from the prewar days. The postwar classes will be composed of students whose ages may differ widely. The older students in their eagerness to get all they can out of their schooling may increase the scholarship standards to such a degree that the younger members of the class will find themselves left far behind. The accelerated methods used in the armed-services training will make the lecture method of teaching seem as antiquated and as obsolete as a horse-drawn streetcar. Classroom demonstrations, visual aids including slide films and movies, and class-laboratory combinations should be considered both from the standpoint of covering more material more effectively and the possibility of introducing more humanistic-social training into the curricula. The combination of related matter into larger course units will make possible more concentrated effort on the subject by the student and reduce the number of subjects to which he is required to devote his energies at one time. Such a presentation should make possible better assimilation and retention of the subject matter by the students.

Before we proceed too far with remaking our curricula for the postwar period it would be well to re-read the report of the Society for the Promotion of Engineering Education, Committee on Engineering Education after the War, published in the May, 1944, issue of the *Journal of Engineering Education*.

Numerous proposals have been made as to the best method of rehabilitating the ex-serviceman. True, there will be occasional cases where special consideration will be required. However, out of the 900,000 servicemen who are prepared for and desire college training, as indicated by a study made by the armed forces, we need not expect too large a number to find their way into ceramics. Ceramic art and pottery making may play a part in occupational therapy, but the soothing and healing properties to be gained from ceramic engineering and ceramic technology are doubtful. When the veterans return to college to continue their education, the quickest and sanest way to bring them back to normal behavior and normal mental processes is to treat them as normal students. The less fuss made over them the better they will like it and the more rapid will be their return to the civilian attitude.

Since the war started, Government agencies have been exceedingly active on secret developments, as well as some that have not been so secret, in all fields including ceramics. These wartime developments perhaps can be applied to civilian consumer goods to good advantage. Those schools and colleges which are in a position to do so will certainly carry on researches in this field.

As brought out at the meeting of the Institute of Ceramic Engineers last year and as contained in the new definition developed by The Society's Committee on Nomenclature (see p. 26, January, 1945, *Bulletin*), the entire field of products manufactured from nonmetallic minerals, except ores and fuels as such, comes under the term "ceramics." Most of the ceramic departments have recognized this all-inclusive definition of ceramics for a long time but have continued to put a large part of their emphasis on clay products. With the revision of course material for postwar use careful consideration should be given to all phases of the nonmetallic field which comes under the heading of "ceramics."

Another item that should be considered in the planning of postwar ceramic curricula is the inclusion of enough engineering subjects so that the graduate can pass the state examinations for engineering registration when they become eligible. Under the existing curricula, even some of those which have E.C.P.D. approval, the ceramic engineering graduate would have to depend on a grandfather's clause or peruse a textbook or two on hydraulics and thermodynamics to become a registered engineer in states as strict about registration as the State of New York.

We, as ceramic educators, have a very definite responsibility placed upon our shoulders. The young people who come to us spending their precious time and money for an education in ceramics are trusting souls. We cannot afford to let them down.

—CHARLES M. DODD, *President, 1944–1945*

REPORT OF COMMITTEE ON RULES

During the past year, 1944–1945, it has been deemed advisable to make certain changes to the Rules of The Council, in order to make them conform to the "single-ballot" procedure as well as conform to the Constitution, By-Laws, and Rules of The Society, Divisions, and Classes. It is our understanding that Rules of The Society, Divisions, and Classes will be published in their complete and revised form this coming year.

The only changes to the Rules of The Council deal with Article ECR VII, Nominations and Elections.

In presenting the changes in Article ECR VII, which we submit to you in mimeographed form, we wish to refer you to the Rules of The Council as published in *The Bulletin of The American Ceramic Society*, **17** [10] 394–95 (1938) and as revised in 1944. The revision of the original rules was published in *The Bulletin*, **23** [7] 232 (1944).

We trust that these changes meet with your approval and that you so notify the President of the Ceramic Educational Council.

—R. M. CAMPBELL, *Chairman;* A. I. ANDREWS, AND A. L. JOHNSON

PROPOSED AMENDMENTS TO RULES OF THE CERAMIC EDUCATIONAL COUNCIL

Article ECR VII. Nominations and Elections

(1) As soon as possible after each Annual Meeting, the President shall appoint a Nominating Committee of three (3) Council members. It shall be their duty to report their nominations for officers of The Council, together with their acceptance in writing, to the President of The Council at least ninety (90) days before the opening date of the next Annual Meeting of THE SOCIETY.

(2) Seven (7) members of The Council may, by petition, appoint a second Nominating Committee of three (3) Council members who shall also report their nominations for officers of The Council, together with their acceptance in writing, to the President of The Council at least ninety (90) days before the opening date of the next Annual Meeting.

(3) (*a*) The President of The Council shall, at least seventy (70) days before the opening date of the next Annual Meeting of THE SOCIETY, forward to the General Secretary of THE SOCIETY the names of all nominees for officers of The Council. Ballots shall be prepared, submitted to the members of The Council, and returned as provided in the By-Laws and Rules of THE SOCIETY.

(*b*) The results of the election shall be determined and reported as provided in the By-Laws and Rules of THE SOCIETY.

(4) (*a*) The Council Nominating Committee or Committees shall nominate one or more candidates for the office of Trustee representative of the Council and shall certify their names, together with their acceptance in writing, to the President of The Council at least ninety (90) days prior to the opening date of the Annual Meeting of THE SOCIETY at which the triennial term of the Trustee representative expires, or when there is an interim vacancy to be filled.

(*b*) The President of The Council shall, at least seventy (70) days before the opening date of the said Annual Meeting of THE SOCIETY, forward the nomination or nominations for Trustee representative of The Council to the General Secretary of THE SOCIETY. Ballots shall be prepared, the election held and reported as provided in the By-Laws and Rules of THE SOCIETY.

(5) In the event of election as President, Vice-President, or Treasurer of THE SOCIETY, or in the event of refusal to act, incapacity to act, or the resignation of the Trustee representative of The Council, a successor shall be appointed by the President of The Council to serve until the next Annual Meeting of THE SOCIETY at which time a new Trustee representative shall be elected to fill the unexpired term, if any, as provided in Section (4) hereof.

(6) Vacancies in the Executive Committee of The Council may be filled by appointment by the ranking officer of the said Executive Committee.

REPORT OF COMMITTEE ON CERAMIC CURRICULA AND COURSE CONTENT

In casting around for a field of endeavor to which your Committee might best bend its effort, a number of thoughts were considered, but most of these required surveys and questionnaires which, in these days, when questionnaires and forms are a daily irritation, did not seem advisable. Instead, it was felt that a review and commentary on the S.P.E.E. Report of the Committee on Engineering Education after the War would be of considerable value, for the accrediting of ceramic engineering curricula is more or less at the mercy of the S.P.E.E. through the E.C.P.D. It therefore behooves the Ceramic Educational Council to take cognizance of the trend of thought in the S.P.E.E. and to discuss the future policy of our organization toward their recommendations. If the ideas proposed are accepted by the majority of engineering institutions, ceramic curricula will find themselves considerably out of line

and the ceramic departments will have to decide whether or not to conform. The changes proposed are in some cases quite radical. The appropriate time to consider them is now when changes can be made in curricula without inconveniencing large numbers of students.

The thought of the engineering profession has been drawn to several problems with which all present are undoubtedly familiar. One such problem is the need for engineers with a high degree of training, so that they may take over the engineering applications of the discoveries made in physics and chemistry. There has been a strong tendency, in the war period especially, for physicists to take over the practical applications of their own discoveries. The personal knowledge of your Committee contains numerous instances in the field of ceramics, indicating the preference for physicists by certain industrial corporations, particularly those with large research laboratories. If this field is to be saved for the engineer, men with adequate training must be supplied.

Another problem is the increasing use of engineers in management capacities. If this is to be fostered, special training of men for management is desirable.

On the other hand, there is a large demand for engineers with their present qualifications that cannot be neglected.

Still another problem is the somewhat belligerent separation of the liberal arts from engineering. One cannot avoid the fact that the humanistic and sociologic knowledge of the present has not reached a stage as advanced as the scientific knowledge and the engineering applications of science. One even hears the suggestion that a moratorium be called on further scientific and engineering developments until the special problems involving intelligent use of the scientific fruits can be solved. It is, of course, impossible to call such a halt and keep science static ready to go on again at a future date. The result has been the prostitution of the benefits of science to destructive ends as well as toward socially desirable ones. It is time that the engineers had a greater voice in the social uses to which their products are put. To do this, they must assume some responsibilities and learn the language of the social sciences. If the liberal arts graduate will not learn the engineer's ways of thought, then the engineer must learn the ways of thought of the liberal arts. In the past, the engineer has had to absorb the knowledge of the social sciences as extracurricular material. The question is now whether or not to start the engineer along these socially desirable ways of thought in his more youthful days as an undergraduate.

Here are several problems that, at first glance, may seem at loggerheads and all of them seem to require extending the period of time for education much as the medical profession has done to solve similar problems. Yet numerous surveys of the achievements of outstanding men of science in the past have shown that the late twenties and early thirties are the most productive years of life. Education is eating into life and productivity. It is perhaps unwise to go too far in increasing the years of formal study.

It is with these problems that the S.P.E.E. Committee on Engineering Education after the War has struggled and they have reached some rather definite conclusions and recommendations. Their report may be found in full in the May, 1944, issue of the *Journal of Engineering Education*, and a summary of the report is published in the September, 1944, issue.

Briefly stated, the report proposes (1) that the four-year undergraduate curriculum be retained, with certain modifications, as a norm for the majority of engineering students and (2) that the curricula be organized in parallel articulated sequences of scientific-technologic and humanistic-social studies extending throughout the undergraduate period, each planned for the achievement of clearly specified goals.

In implementing the first item, certain important recommendations are made and provisions for the management and high-level practices are outlined.

The S.P.E.E. committee recommends (1) a continuation of the present four-year program as a terminal course with such modification as is necessary to incorporate the humanistic-social studies, (2) an alternative fourth year emphasizing courses for management of industry, and (3) a fourth year intended to prepare for an additional year or years of advanced study by strengthening the student's command and extending his knowledge of the basic sciences and mathematics and by introducing him to the methods of advanced study. This fourth year and the year or years to follow should be planned as a unit, rather than as the two stages of the present undergraduate and graduate programs.

By such a system, the committee hopes to maintain the flow of graduates to fill the positions now filled by engineering graduates and to provide two new types of graduates, one to serve in management and the other at the high levels of scientific knowledge and practice.

It might be well to comment that one method that is now being tried to solve these problems is the five-year course in engineering. Cornell University, for example, has instituted such a program for all engineering courses, but this device is not in line with the recommendation of the S.P.E.E. committee for the majority of engineering students.

To find room in the four-year course for all that is needed, the committee suggests increasing the entrance requirements both from the standpoint of subject matter such as mathematics and science and from the standpoint of intelligence and adaptation to engineering. The elimination of some of the inert factual material from present courses also is suggested.

It is recommended that the accelerated three-year course be abandoned as soon as possible in favor of the standard four-year–eight-semester or twelve-quarter system. A number of advantages are pointed out. The desirable feature of summer for industrial experience for the student, for uninterrupted research for faculty, and for rest for both to avoid jaded appetites for the educational process and the need of the additional year to provide greater maturity and mental growth in the student are two well-made points. The special cases wanting to accelerate, it is noted, can be taken care of in regular summer schools.

With regard to returning veterans, the committee recommends that colleges be as liberal as possible with regard to entrance requirements and credits for work taken as a member of the armed forces, but that in no case should sound educational requirements for thorough training be sacrificed, for this would be injustice to the student and would jeopardize the reputation of engineering students.

The second main point of the committee report is the increased emphasis on the humanistic-social studies, which the committee states should constitute 20% of the curriculum and should not be less than one three-hour course per semester in each of the eight semesters. The subject matter should be drawn from the fields of history, government, economics, sociology, literature, philosophy, and psychology.

In the 1942–1943 report of the Committee on Ceramic Curricula, the evidence shows that if we include economics and English, the present ceramic curricula average about 10% of these humanistic-social studies and it is perhaps a question whether a course in English Composition or professional report writing should be included under such a classification. It is, therefore, evident that drastic redesigning of ceramic curricula would be necessary, if the ceramic departments were to conform to the recommendations of the S.P.E.E. committee.

Methods of teaching and the organization of the humanistic-social sequence are dealt with, in the report, by specific suggestions.

The scientific-technological studies the committee felt were rather well organized at present and must be preserved. Three points are emphasized: (1) that this branch can be greatly harmed by attempts to crowd too much inert subject matter into the course, (2) that the principles underlying engineering practice, together with sufficient factual knowledge of practice, constitute, respectively, the skeleton and the flesh of engineering and

must be inculcated, if the program is to be engineering rather than pure science, and (3) that indoctrination in the ideals and responsibilities of the profession must be stressed.

To summarize, the S.P.E.E. committee would solve the problems confronting engineering education partially by throwing some responsibility back on the secondary schools through the force of entrance requirements; partially by introducing more of the humanistic-social studies into the engineering curricula; and partially by providing for diversification of the fourth year to attain particular objectives for three different types of graduates.

To us, as ceramic educators, they present problems that will not be easy to solve. Perhaps there is no perfect solution, but the handwriting is on the wall and we cannot escape consideration and discussion of these recommendations.

It is the recommendation of the Committee on Ceramic Curricula and Course Content that the Ceramic Educational Council discuss its policy with respect to the recommendations of the S.P.E.E. Committee on Engineering Education after the War and that the individual ceramic departments consider the recommendations in the light of their specific limitations in order to decide whether or not to conform. If conformity is decided upon, a task of no mean magnitude is ahead. It is recommended that the Committee on Ceramic Curricula and Course Content act as a clearinghouse for ideas from the various departments so that as great a degree of uniformity as possible can be obtained.

—C. R. AMBERG, *Chairman;* J. L. CARRUTHERS, AND P. G. HEROLD

REPORT OF COMMITTEE ON PHYSICAL CHEMISTRY

Many students in ceramics have objected to their required study of physical chemistry on the basis that they see no practical application of the subject. They do not realize that applications of physical chemistry are involved in many common ceramic processes which deal with, for example, the properties of colloids, the drying and firing processes, the combustion of fuels, and the study of high-temperature equilibria.

In our opinion, the subject of physical chemistry should consist of a two-semester course, meeting three times a week, with a supplementary laboratory course if time permits. The first semester should be devoted to the study of a suitable textbook on elementary physical chemistry, whereas the second semester should consist of a course in heat and thermodynamics.

Since the subject matter of an elementary textbook on physical chemistry is covered in one semester, some topics must be considered in a brief manner. We believe that the fundamental laws and theories of physical chemistry (as the kinetic theory of gases, chemical equilibria, crystal chemistry, and atomic structure) should be stressed in preference to the usual detailed study of dilute solutions.

Concerning the second-semester course in heat and thermodynamics, we prefer the approach of the physicist to that of the chemist. For our work, we consider the text of J. K. Roberts to be satisfactory if undue stress is not placed on applications to mechanical engineering.

The function of the teacher of physical chemistry should be to introduce the subject to the student and provide a good foundation in this branch of science. The burden of teaching applications of physical chemistry to ceramics should rest with the ceramic engineering staff.

—A. E. BADGER, *Chairman;* AND C. G. HARMAN

WHITE WARES DIVISION

The officers and committeemen of the White Wares Division will meet at Mellon Institute, Pittsburgh, Pa., Saturday forenoon, October 13, 1945.

REPORT OF COMMITTEE ON STATISTICS

The Committee on Statistics was appointed to gather data which might be used by The Council at its annual meeting. When it appeared certain that a general meeting would not be held, plans were dropped for a survey of the ceramic schools to obtain various information.

The Committee was glad, however, to encourage C. D. Clawson, Vice-President of the Ferro Enamel Corp., Cleveland, Ohio, to prepare a review of the trend in the number of students with ceramic training graduating in recent years. Mr. Clawson is using the information in an article to appear in an early issue of *The Enamelist.** The conclusions presumably will be similar to those of "The Road to Scientific Bankruptcy," *Time*, page 67, February 12, 1945, for the fields of chemistry, mathematics, engineering, and physics.

A summarizing table and graph have been prepared by this Committee for the use of The Council, but it is felt that the material should not be published, as it would anticipate and duplicate Mr. Clawson's article. The information is admittedly incomplete, but the trend is shown clearly.

—E. C. HENRY, *Chairman;* T. N. MCVAY, AND P. S. DEAR

* "Who Will Operate the Postwar Porcelain Enameling Plant?" *Enamelist*, **22** [8] 6–9, 54–55 (May, 1945).
See also article by A. S. Watts, *Bull. Amer. Ceram. Soc.*, **24** [8] 305–306 (1945).

WELL, WHAT DO YOU KNOW! . . .

The following clipping was sent to The Society offices by Robert Twells, Electric Auto-Lite Co., Spark Plug Div., Fostoria, Ohio. It was taken from the *Cleveland Plain Dealer* of June 9.

Swastika Hard to Find in Germany

BY JOSEPH W. GRIGG

FRANKFURT-AM-MAIN, June 8—The hardest thing to find in Germany today is a swastika.

I spent the whole day searching for Nazi signs in this city which once was the stronghold of the notorious Nazi leader Wilhelm Sprenger. I found exactly two swastikas. One was on the name plate of the Frankfurt branch of the Reich Social Insurance office and the other was on the local labor front bureau building.

The Adolf Hitler Bridge over the Main River was blown up by the retreating Wehrmacht and the name plates have been removed. The Hermann Goering Quay along the river has been renamed Upper Main Quay.

The people of Frankfurt have done a tremendously thorough job of cleaning up billboards and removing all Nazi posters.

One Frankfurt business house, belonging to a firm of glass manufacturers, had a typed notice in English pasted on the front door. The notice said the company "never had a connection with any political party" and asserted that it belonged to the **"Ceramics Association of Columbus, Ohio."**

A NEW BLAST FURNACE IN MEXICO

On June 2, 1945, to the accompaniment of prayers by the local padre, a new blast furnace was blown in at Monclova, Mexico. This plant is rebuilt from equipment of an older steel plant which operated in the St. Louis district. It is expected that it will be possible to produce cast-iron pipe, hot- and cold-rolled steel products, and strip and tin plate in the near future. Day & Zimmermann, Inc., consulting engineers of Philadelphia, Pa., supervised the dismantling and installation.

THE PRESIDENT'S PAGE

THE END OF THE WAR AND ITS EFFECT ON THE SOCIETY

By C. Forrest Tefft

The war is over. We are all thankful and we rejoice in its successful conclusion even as we remember those to whom it meant great sacrifice and suffering.

But it is behind us. Our task is ahead. We might say, "Whither The Society?"

Naturally our most important concern at the moment is the return of the members of the industry from the services—not only those who already have an established place, but those who had no chance to leave their mark on the ceramic industry. These men are coming back. They will bring new ideas of organization which they have learned from years of doing things, not by themselves, but with others. They have been thoroughly trained in cooperation. They know the power of cooperative effort. This skill they will bring to bear on the problems of the industry.

What must The Society do for them? First, it must give them a place where they can meet other like-minded individuals. Few plants in the industry will be able to employ a platoon or even a squad of ceramists. Some of the larger plants may employ several men, but many plant managers will be happy if they can have one technically trained man to control processes and perhaps another on research work. So The Society organization becomes the logical meeting place for these men.

The publications must likewise serve the needs of the somewhat isolated ceramist. They must bring him the technical news of his profession. Many would like to return to school; some, thanks to the G.I. Bill and through their own resourcefulness and initiative, will do so. Many cannot. The latter must catch up from a few months to several years of lost contact with their art.

Publications Committee, you are likewise charged with a responsibility. You must determine the policies that will make *The Journal*, *The Abstracts*, and *The Bulletin* of increasing usefulness to our members. Although this is important to all members, it is vital to members who are not attached to Local Sections.

We must have scientific papers and technical articles which will let them know what is happening in the industry.

You can only write a few of these papers yourself, but your policies will determine whether the better-versed members will supply them regularly for publication.

Meetings will be possible again—maybe this year—surely next. Division officers must start now to plan for our next Annual Meeting. We all want this to be an important and successful occasion.

The members of the Ceramic Educational Council can render an additional service to the returning serviceman by immediately laying plans for the reorganization of student sections. In 1941–1942 we had thirteen student groups functioning at the universities. One of these branches retained its organization until the fall of 1944, but now all are out of business. Returning students will

C. Forrest Tefft, President, The American Ceramic Society

be older. They will know much more about organization work. They will want an institution like The Society. They will be receptive to the idea of affiliation with a national organization. They will be ready to rehabilitate the Student Branches.

If draft regulations are relaxed, many younger men will appear at the colleges. They will also be receptive to membership in The Society if they see the older, more experienced men taking a prominent place in these groups.

I cannot urge too strongly that our teachers lay plans for Student Branches at once, starting when as few as ten students have returned to their departments.

To Chairmen of Local Sections I address a special appeal for the former servicemen. Invite them to your meetings, put them on your committees and programs. Thus you will strengthen your own Sections and at the same time help these men return to a normal business career.

Names of former servicemen who have returned to your cities will be sent to you as fast as the office receives the changes of address. Notices of your meetings will be a pleasant introduction for them into your community.

There are many other things which The Society should do in this immediate postwar period, but these are the most important now. Strong Local Sections and strong Student Branches will support a strong Society.

Officers, you must be ready to act, ready to welcome our returning service members.

LOCAL SECTION NEWS

UPSTATE NEW YORK SECTION

The Upstate New York Section met June 22, 1945, at the Baron Steuben Hotel, Corning, N. Y.

As The American Ceramic Society Meeting was cancelled, a technical program was arranged for the afternoon. The following papers were presented:

(1) "A Wick Test for Efflorescence" by L. H. WASHBURN, New York State College of Ceramics, Alfred, N. Y.

(2) "Study of Nickel Flashing and Its Relation to Enamel Adherence" by E. WAINER and W. J. BALDWIN, Research Labs., Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

(3) "Effect of a Number of Oxides on Surface Tension of Silicate Melts" by C. R. AMBERG, New York State College of Ceramics, Alfred, N. Y.

(4) "Problems in Shaping and Burning" by I. M. REIPSCHMEL, New York.

After a dinner and short business meeting, the evening session was concluded with an address by Mark Ellingson, president of the Rochester Institute of Technology, Rochester, N. Y. Dr. Ellingson spoke on the subject "Education in an Age of Technology."

The following officers were elected for 1945–1946:

Chairman: H. R. LILLIE, Corning Glass Works, Corning, N. Y.
Vice-Chairman: HOWARD FAILMEZGER, Victor Insulators, Inc., Rochester 10, N. Y.
Secretary: RALPH VAN PEURSEM, Rochester Institute of Technology, Rochester 8, N. Y.
Treasurer: J. M. BLACKWOOD, Carborundum Co., Niagara Falls, N. Y.
Councillor: M. E. HOLMES, New York State College of Ceramics, Alfred, N. Y.

—MILTON H. BERNS, *Chairman*

SOUTHERN CALIFORNIA SECTION

A meeting of the Southern California Section was held July 10, 1945, at the Baux Restaurant, Los Angeles, Calif. The attendance was low, totaling only thirty-eight members.

This meeting was under the auspices of the Glass Section, and the program was as follows:

(1) "History of the Glass Industry in Southern California" by VERNON N. RUST, manager, Glass Containers, Inc., Los Angeles, Calif.—A survey of the various glass-producing plants in the area, their products, and their evolution.

(2) "Some Applications of Glass Technology to Glass-Container Manufacture" by V. C. SWICKER, director, Research Dept., Alexander H. Kerr & Co., Inc., Santa Ana, Calif.—An interesting discussion of the technical solution of some practical glassmaking problems.

Following the meeting, a party of members toured the plant of Glass Containers, Inc.

—W. O. BRANDT, *Secretary*

NEW YORK METROPOLITAN SECTION

The first meeting of the New York Metropolitan Local Section will be held in New York, N. Y., October 17, 1945. Joseph A. Pask, Research Dept., Lamp Division, Westinghouse Electric Corp., Bloomfield, N. J., is acting as Chairman of the Organizing Committee and Cyril B. Delgado, editor of *Glass Industry*, New York, N. Y., is making the arrangements. As there are more than two hundred members of The American Ceramic Society in the metropolitan area, this meeting should be well attended.

CHICAGO SECTION

The Chicago Section will devote its first meeting this autumn to incentive plans for wage payment in ceramic plants. This program is intended to reflect the interest in the problems of operation under postwar conditions and to prepare managers for the competitive period ahead.

The meeting will be held October 5, 1945, at the Electric Club on the top floor of the Chicago Civic Opera House, Chicago, Ill. Dinner will be served at 6:30 P.M., with talks and discussion to follow. Members of The American Ceramic Society from other parts of the country are invited to attend. The Electric Club is noted for the good dinners which have been served even during the recent days of stringency.

—J. J. SVEC, *Secretary*

NORTHWESTERN OHIO SECTION

The Northwestern Ohio Section will launch its 1945–1946 program October 18, 1945, with a talk by A. I. Andrews, head of the Ceramics Department of the University of Illinois, Urbana, Ill.

Professor Andrews will discuss the contributions of ceramic arts and industries to modern society.

—HAROLD A. MCMASTER, *Secretary*

PITTSBURGH SECTION

A meeting of the Pittsburgh Section was held in East Liverpool, Ohio, September 14, 1945. Plans for this meeting were made under the able guidance of Arthur A. Wells of the Homer Laughlin China Co., Newell, W. Va.

After meeting at the Traveller's Hotel at 12:30 P.M., the group visited several potteries in the East Liverpool district. Arrangements for the trip were made by J. W. Hepplewhite, Edwin M. Knowles China Co., Newell, W. Va.

Following the inspection trip, the group adjourned to the East Liverpool Country Club for golf, barbecue dinner, and general good time.

—J. S. NORDYKE, *Chairman, Publicity Committee*

PITTSBURGH SECTION AUTUMN MEETING

Plans are now under way for the Autumn Meeting of the Pittsburgh Section to be held at Mellon Institute, Pittsburgh, Pa., Friday, October 12, 1945.

The following papers have been assured to date (August 24, 1945). In addition, another enamel paper is expected and several on or related to whiteware.

(1) "Effect of Iron on Fluorescence in Glass" by LUKE THORINGTON AND RALSTON RUSSELL, JR., Research Labs., Westinghouse Electric Corp., East Pittsburgh, Pa., AND ALEXANDER SILVERMAN, Dept. of Chemistry, University of Pittsburgh, Pittsburgh 13, Pa.

(2) "Testing Chrome-Magnesite Brick for Resistance to Iron Oxide Bursting" by SAMUEL ZERFOSS AND H. M. DAVIS, Pennsylvania State College, State College, Pa.

(3) "Some Special Wartime Investigations of Ceramics" by DWIGHT G. BENNETT, Special Research Professor, Dept. of Ceramic Engineering, Univ. of Illinois, Urbana, Ill.

(4) "Developments in Superduty Silica and High-Alumina Refractories" by C. A. BRASHARES, Harbison-Walker Refractories Co., Pittsburgh, Pa.

(5) "Annealing Strains in Glass and Their Degree of Permanence; Measurements of Optical Retardation over a Seven-Year Period on Glass Container Manufacturers' Standardized Disks" by L. G. GHERING, Preston Laboratories, Butler, Pa., AND T. D. GREEN, Hartford-Empire Co., Hartford 1, Conn.

(6) Paper on a glass subject from the Research Laboratories, Pittsburgh Plate Glass Co., Creighton, Pa.

In view of the cancellation of Division meetings and the indefinite plans of The Society, it is hoped that greater emphasis on such Local Section meetings will stimulate the presentation of papers suitable for publication.

The Technical Session will be followed by a dinner and dance with other entertainment to include the ladies at the University Club.

Meeting of Glass Division Research Committee

Alexander Silverman has called a meeting of the Research Committee of the Glass Division, which will be held at 12:00 M. at the Faculty Club, University of Pittsburgh, Pittsburgh, Pa., October 12. Members of the Committee are Alexander Silverman, *Chairman;* C. E. Leberknight, and O. G. Burch.

—J. S. NORDYKE, *Chairman, Publicity Committee*

PROGRAM OF SOUTHERN CALIFORNIA SECTION FOR 1945–1946

The following meetings have already been scheduled by the Southern California Section:

September: Talk on "Labor Relations" by ROBERT GAY, California Institute of Technology, Pasadena, Calif.

October: Social event.

November: Discussion of "The Fuel Situation in Southern California" by engineers of the Southern California Gas Co., Los Angeles, Calif.

January: Talk by PERRY D. HELSER, Gladding, McBean & Co., Los Angeles, Calif. (topic to be announced).

This Section has held two meetings of Divisions this summer, Glass and Design. The growth of the ceramic industry in Southern California is showing up in the activities of members of The American Ceramic Society.

—C. S. CHAFFEE, *Chairman*

DESIGN DIVISION OF SOUTHERN CALIFORNIA SECTION

The newly formed Design Division of the Southern California Section held its second meeting August 20, 1945, at Harris Hall on the University of Southern California campus. About sixty were present. An election of officers was held which resulted in the following organization: *Chairman,* WILLIAM MANKER; *Vice-Chairman,* ROSEMARY RYAN; and *Secretary-Treasurer,* HILDRETH REENTS.

Glen Lukens told of the new work that he was undertaking in Haiti, and Herb Thomas of the L. H. Butcher Company spoke of the availability of ceramic raw materials.

Clare Chaffee discussed the relationship of the Southern California Section with The American Ceramic Society.

The next meeting was set for September 27 in Harris Hall, University of Southern California campus.

—C. S. CHAFFEE, *Chairman*

UPSTATE NEW YORK SECTION

The Autumn Meeting of the Upstate New York Section will be held in Hornell, N. Y., with the date tentatively set for Friday, October 26, 1945.

—RALPH VAN PEURSEM, *Secretary*

MICHIGAN SECTION

The Autumn Meeting of the Michigan Section will be held at the Horace H. Rackham Memorial in Detroit, Mich., Tuesday, September 25, 1945. This will be a joint session with the Engineering Society of Detroit. Dinner will be served in the banquet hall at 6:30 P.M., after which the members will assemble with the Engineering Society in the main auditorium.

Robert A. Weaver, president of the Ferro Enamel Corp., Cleveland, Ohio, will give an address entitled "The Development of Porcelain Enamel from Ancient Art to Modern Industry." Mr. Weaver is the owner of a fine collection of enameled art objects, of which he has made an extended study. Following his talk, a film depicting the development of the ceramic aircraft spark plug will be shown.

—J. F. QUIRK, *Chairman*

BALTIMORE-WASHINGTON SECTION

The Autumn Meeting of the Baltimore-Washington Section will be held at the Continental Hotel on the Union Station Plaza in Washington, D. C., Saturday, October 13, 1945. The dinner will be served at 6:30 P.M. in the air-conditioned dining room which will comfortably seat one hundred persons. The program will consist of two papers of extremely popular appeal.

R. R. McGregor of Mellon Institute, Pittsburgh, Pa., will give a paper on "Silicones in the Ceramic Industry and Their Uses as Adsorption Inhibitors." G. R. Shelton of the National Bureau of Standards, Washington, D. C., will discuss "Correlation of Chemical Composition with the Glassy Bond and Properties of Ceramic Bodies."

Members from other Sections who happen to be in Washington on this day should note the date and arrange to attend.

—P. J. YAVORSKY, *Secretary*

CENTRAL OHIO SECTION

The annual Autumn Meeting of the Central Ohio Section will be held in Columbus during the latter part of November or the early part of December. With relief from travel restrictions it is hoped that all members in Central Ohio will return to the old practice of driving to Columbus for this meeting.

—W. E. CRAMER, *Chairman*

MEMBERS IN SERVICE*

The following members of this Society are in fighting units of war service. There are several in service in Washington not included in this Service Roster. This list, which was begun September, 1942, and added to each succeeding month, is probably not complete, and we would appreciate information on other members.

(455) PHILIP D. BALCOM, Abrasive Products, Inc., South Braintree, Mass.
(456) ALAN B. JOHNSON, Babcock & Wilcox Co., Atlanta, Ga.
(457) PAUL V. JOHNSON, National Bureau of Standards, Washington 25, D. C.
(458) ERNEST A. KUHLMAN, Shenango Pottery Co., New Castle, Pa.
(459) EDWARD L. MOONEY, Scintilla Magneto Div., Bendix Aviation Corp., Sidney, N. Y.
(460) EDWARD D. PSEMENEKI, Hardwick-Hindle, Inc., Bayonne, N. J.
(461) DOUGLAS E. ROUDABUSH, 107 Browning Ave., Altoona, Pa.
(462) ROBERT J. ULRICH, American Radiator & Standard Sanitary Corp., Litchfield Plant, Litchfield, Ill.

* These are in addition to the lists published monthly, beginning with the September, 1942, *Bulletin,* with the exception of the June, 1943, issue.

CERAMIC SCHOOL NOTES

J. EDWARD WALTERS ELECTED PRESIDENT OF ALFRED UNIVERSITY

The Board of Trustees of Alfred University, Alfred, N. Y., has elected J. Edward Walters to the presidency of that institution. Dr. Walters took office September 1, 1945. He left the firm of McKinsey & Company, Management Consultants, in New York City, of which he was one of the principals, to go to Alfred. Dr. Walters has specialized in personnel management and labor relations, including the many complicated problems developed by wartime business operations.

As Director of Personnel for Purdue University, Lafayette, Ind., from 1926 to 1940, he acquired a fine working knowledge of the administrative questions which face the head of a large university. The postwar operation of Alfred University will be a challenge to the creative abilities and imagination of a man like Dr. Walters.

Biography

J. Edward Walters was born March 19, 1896, at Corydon, Indiana. He was graduated from the Corydon High School in 1914 and went on to Indiana University. Later he attended Purdue University, receiving his Bachelor of Science degree in Mechanical Engineering in 1922 and his Master of Science degree in the same field with industrial and personnel relations majors in 1923. During his college years he also spent some time at the University of Dijon in France and the University of Pennsylvania. Later he attended the University of Chicago and in 1934 received his Doctor of Philosophy degree from Cornell University, again majoring in personnel administration with minors in education and economics.

He is a member of Tau Beta Pi, Pi Tau Sigma, Iron Key, and Sigma Chi.

War Record

During World War I he served as First Lieutenant of Ordnance, with one year in France. He retired to the Reserve Corps with the rank of Captain.

Professional Experience

Dr. Walters began work as a mechanic for V. H. Bulleit & Sons and assistant to the manager of the L. N. A. & C. Railroad. At Purdue he was general manager of the Purdue Memorial Union from 1922 to 1926. From 1926 to 1940 he served as Director of Personnel for Purdue University, including not only the handling of the personnel work of the University organization but also teaching Personnel and Industrial Relations in the Schools of Engineering and Science.

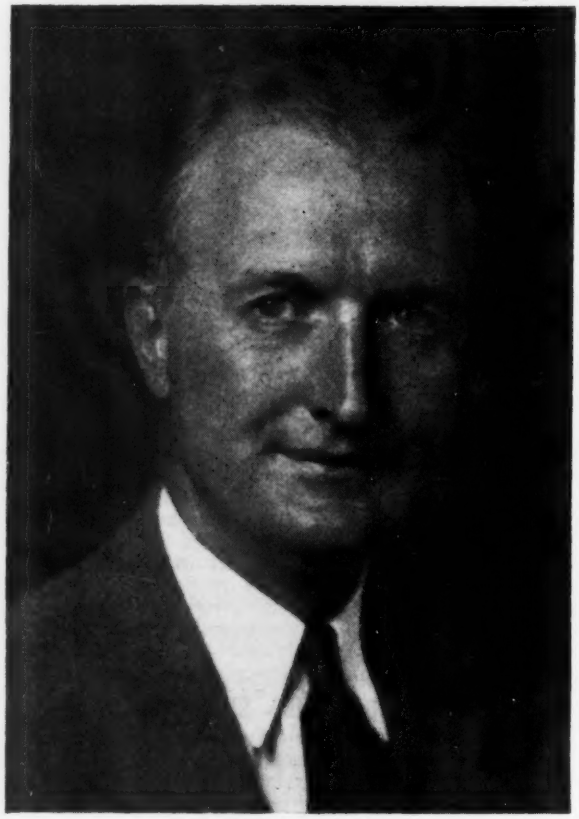
In 1941 he was elected Vice-President of Revere Copper & Brass, Inc., of Rome, New York. In this capacity he was in charge of personnel and labor relations.

In 1943 he left Revere to become a principal of McKinsey & Company. As such he collaborated on many projects requiring the skillful handling of large groups of employees with particular reference to the development of modern personnel administration methods.

In the professional field, Dr. Walters has served as president of the American College Personnel Association, secretary of the Ross-Ade Foundation of Purdue University, secretary of the Indiana Personnel Association, and president of the Association of University Unions.

Professional Societies and Clubs

American Society of Mechanical Engineers, Society for the Promotion of Engineering Education, Society for the Advancement of Management, American College Personnel Association, and Rotary Club.



J. Edward Walters

Publications

(1) Student Development. Isaac Pitman & Sons, New York, 1931. 195 pages.

(2) Applied Personnel Administration. John Wiley & Sons, Inc., New York, 1931. 338 pages.

(3) Individualizing Education by Means of Applied Procedures. John Wiley & Sons, Inc., New York, 1935. 271 pages.

(4) Series of Special Sections on Personnel Administration and Industrial Relations, *Factory Management and Maintenance*, Dec., 1936; June, 1937; Feb., 1938; June, 1939.

(5) Modern Management. John Wiley & Sons, Inc., New York, 1937. 337 pages.

(6) Personnel Relations, Their Application in a Democracy. Ronald Press Co., New York, 1944.

(7) (Edited with R. J. Greenly) "Personnel and Industrial Relations." A series of proceedings of the Annual Industrial Personnel and Industrial Relations Institutes at Purdue University.

(8) Numerous other bulletins and articles on industrial and educational personnel administration.

INDUSTRIAL CHEMICALS

Industrial chemicals and specialties interesting to those in the ceramic industry are described in a booklet issued recently by the Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

THE ARTHUR S. WATTS SCHOLARSHIP FUND

The Ohio State University Development Fund has announced the establishment of The Arthur S. Watts Scholarship Fund. It was created by the alumni of the classes of 1914 to 1941, inclusive, of the Department of Ceramic Engineering of The Ohio State University, Columbus, Ohio, to honor the long and meritorious service of Arthur S. Watts as Professor and Chairman of the Department and to express their appreciation of the interest, counsel, and many kindnesses extended by him during both their college and professional careers.

Before the Ohio State Ceramic Alumni Dinner held during the 1942 Annual Meeting of The American Ceramic Society, the former students of Professor Watts and several friends subscribed to a fund through which their appreciation of him might be fittingly expressed. At the dinner, Professor Watts was presented with a complete set of office furniture and a bound volume of testimonial letters.* The remainder of the money contributed, amounting to $1500, was deposited with The Ohio State University Development Fund for the establishment of an Arthur S. Watts Scholarship.

Since then, Professor Watts has personally contributed $1800 to the Fund so that the total amount is now $3300. The monies have been deposited in the University's Endowment Fund. The Scholarship will become operative when the principal, through the accumulation of interest and further contributions, is such that the annual interest will amount to $300 per year.

The Arthur S. Watts Scholarship will be awarded annually to the ceramic engineering student who is deemed most worthy and who shall have completed his junior year. The annual recipient of the Scholarship will be chosen by a committee consisting of the Faculty of the Department of Ceramic Engineering, the Dean of the College of Engineering, and the Chairmen of the Departments of Metallurgy and Mineralogy. The worthiness of the student will be based upon scholarship, financial need, aptitude, and other qualities that might predict a successful career as a ceramic engineer.

The Scholarship Fund is now being carried as a project of The Ohio State University Development Fund and as such will be advertised annually by them. The alumni of the Ceramic Department, and others interested, may thus make further contributions so that the Scholarship will be available at an early date. All contributions and income over and above that needed to provide the annual $300 scholarship will be added to the principal amount. If and when an additional $300 annual interest becomes available, a second Arthur S. Watts Scholarship will be established.

To this end, all former students of Professor Watts, and others so desiring, have the opportunity to provide a fitting recognition of a fine scholar, a great friend, and a grand gentleman whose whole life has been devoted to the ceramic industry and the engineers concerned with its welfare.

A biographical sketch and photograph of Professor Watts appeared in the July, 1938, Bulletin, pp. 297–98.

* See the May, 1942, *Bulletin*, pp. 72 and 74.

INSTRUMENT EDUCATIONAL CONFERENCE

An educational conference on instrumentation sponsored by the Carnegie Institute of Technology and The Instrument Society of America has been arranged for October 16, 17, and 18, 1945.

The program will cover (1) the requirements expected by industries and (2) present training in instrumentation.

The chairman of the committee is B. R. Teare, Jr., Head, Department of Electrical Engineering, Carnegie Institute of Technology, Pittsburgh 13, Pa.

MINERAL INDUSTRY OF NEW JERSEY

The rehabilitation and expansion of New Jersey's mineral industry, which has dwindled in output, income, and employment in recent years while national output has increased, is the objective of a geological and ceramic study of the State's mineral resources which will be undertaken by a new Bureau of Mineral Research at Rutgers University, New Brunswick, N. J.

The organization of the new Bureau, a division of the College of Arts and Sciences, the drafting of a plan to guide its investigators, and the personnel of the Bureau were made known by Robert C. Clothier, president of Rutgers University, at a meeting of the Natural Resources Committee of the State Chamber of Commerce held June 26, 1945. Those present included Commissioner Charles R. Erdman, Jr., of the New Jersey Department of Economic Development, and Meredith E. Johnson, state geologist.

Announcement was also made that Alfred K. Snelgrove, chairman of the Department of Geological Engineering of the Michigan College of Mining and Technology and geological consultant to the government of Newfoundland, has been appointed professor of geology at Rutgers and director of the Bureau. Dr. Snelgrove will work in close cooperation with State Geologist Johnson, who has been named as a research associate in geology at Rutgers. A detailed plan for the mineral resources study has been prepared by Paul M. Tyler, mineral economist on leave from the U. S. Bureau of Mines. Mr. Tyler was appointed May 1 as a research consultant to the Rutgers University Research Council.

In 1929, the mines, quarries, and clay pits of New Jersey yielded products worth $72,000,000, but by 1943 their output was down to $38,000,000, despite a nationwide increase in mineral products output in the same period. New Jersey, which was once an important exporter of various sands and clays, has become an importer of some of these products while local deposits lie idle or are being worked on a steadily diminishing scale.

With a more complete knowledge of New Jersey's mineral resources, particularly those of a nonmetallic character, and with the technological developments of recent years, new mineral industries can be brought to New Jersey, those which are dormant can be revived, and those still active can be brought to greater output.

An example of how new technological developments can revive an industry is found in the new use of New Jersey marl or greensand as a water softener. This material was formerly the basis for an important fertilizer industry, but this use was almost entirely abandoned. Now the industry has been revived with the development of its use in an entirely new and larger field.

The membership of the Bureau of Mineral Research comprises Dr. Snelgrove, director; State Geologist Johnson; Paul M. Tyler; all the members of the faculties of the geology and ceramics departments; and Peter A. vanderMeulen, professor of chemistry.

FEW COPIES OF "MARKETING BURNED CLAY PRODUCTS" STILL AVAILABLE

Executives in the clay products industries will be interested to learn that Marketing Burned Clay Products, by A. Hamilton Chute, may still be obtained from its publishers, the Bureau of Business Research, The Ohio State University, Columbus 10, Ohio (price $3.50).

This is the only book to deal exclusively with the business and economic aspects of the fired-clay industries. It is recognized throughout the United States as the authoritative reference source on the history, development, location, marketing methods, and policies of the fired-clay industries. Because it summarizes conditions in the industries as of the prewar period, it should be particularly useful now as a basis for making postwar plans.

For a résumé of this book, see *Ceram. Abs.*, **18** [10] 285 (1939).

★ LETTERS FROM SERVICEMEN ★

Western Pacific,
20 June, 1945

Gentlemen:

I received your letter of June 6 and, though the information you had doesn't pertain to me at the moment, it was of great interest to me for many reasons. Before my entry into the service I was a ceramist in charge of sand control at the Continental Foundry and Machine Co., East Chicago, Ind. The field was pretty new as far as the ceramic application was concerned, or rather the application of ceramic knowledge. I managed to get together many interesting facts about steel foundry sands and much of the work I did with the dilatometer helped increase our plant production and achieve results none of us expected. Through this work, plus a number of letters to and from the American Foundrymen's Association, the ceramists in the foundry field received recognition of value to our service. That, to me, opened up a new unexploited field for the ceramist. I hope that when the returning servicemen do come back, they'll realize the great opportunities in the field of casting sands.

Right now I only wish I could do some ceramic work on this Pacific Island. There is an abundance of clay deposits and it would indeed prove interesting to see how much could be done with the material I've noticed around. Unfortunately the Army has other plans for me and the search for knowledge has been forced to take a back seat. The clay products in this area are handmade by the natives and are very crude from a technical point of view, but rather notable from the aesthetic point. The crockery and chinaware are comparable to our most inexpensive china but they're coupled with very interesting hand designs done with overglaze colors and gold colors. The glazes are comparable to many we have but they show up predominant with cracks, but that may be due to the extreme weather conditions and probable rough handling of which our G. I.'s are the cause.

Unfortunately I'm not at liberty to be any more specific than I have been or reveal any localities, but I'm certain that when the Pacific war is terminated you'll hear much more about what I have spottedly referred to and it will be of as much interest to you as it has been to me.

Until we meet again, I remain

Sincerely yours,
JOSEPH TARRE,
Corporal, U. S. Army

★

New York, N. Y.,
5 August, 1945

Dear Dr. Purdy:

I have been receiving your letters to servicemen for some time now and would like you to know I enjoy their contents! It is one of the very few contacts I have with ceramics and is most welcome in a rather dull life we are leading here as part of the occupational force in Germany.

About the only thing of a ceramic nature I have encountered in my life in the Army is the glass insulator used in our work of building long toll telephone lines. Right at present we are doing our best to keep some glass plant in operation back in the States. We are charged with the maintenance of several hundred miles of telephone lines over a wide area. A bright, shiny glass insulator makes a beautiful target for any G.I. who wishes to brush up on his marksmanship. As a result, we are using quite a few to replace those the result of a good shot. Having at least something to do over here makes life a little more pleasant anyway. Our unit has been on the Continent since a year ago last June, so we are all ready to come home. However, the Army seems to have other ideas and I am afraid we will be here for some time.

The Army has started its education program for troops over here, but I have found very little in the program which is of a ceramic nature. I had hoped some courses would be offered in England on pottery but have been unable to find any. There seem to be courses in other branches of engineering, and perhaps ceramics is missing a good bet to interest some of the Army personnel along their lines. I know of several enlisted men in my own company who plan an education in engineering after their discharge and they are taking advantage of any education they can get under the Army's program. If ceramics were given a little publicity in the education program, it might steer a few of these prospective students into this field.

I trust all goes well in Columbus. Since that is my home, you can be sure I will drop in and see you when again I can take over the title of mister.

Best regards,
ROBERT W. LIMES,
Captain, U. S. Army

★

4 August, 1945

Dear Ross:

As two of your Canadian members of The American Ceramic Society, we have decided that it is just about time that we wrote to thank you for the monthly letter.

During the last two years, our occupations have carried us well out of touch with ceramics. We therefore appreciate the general interest news of The Society and the news of research trends in the industry.

We two graduated together from the University of Saskatchewan under Professor W. G. Worcester and have finally been able to get together on leave. One of the main topics of our chats together has, naturally, been the old times at the University, and postwar employment in ceramics.

Thanks again for the news letters.

Sincerely yours,
J. A. MARLOW,
Lieutenant, Royal Canadian Army Overseas
A. COHEN,
Flight Officer, Royal Canadian Air Force Overseas

★

Galashiels, Scotland,
6 August, 1945

Dear Dr. Purdy:

Thank you very much for your letter to the ceramists in service. I appreciate it very much, especially as it is already six years since I left the U.S.A. to join the Polish Army. During this time I fought three times and was twice interned. It is quite a normal war procedure, but what is more unusual is that I was working for about four years in the enameling industry during my internment in Switzerland. It was rather an interesting job keeping the enameling production on the normal level in view of the lack of raw materials, specially of borax, and trying to make Swiss enamel production independent of German influence.

I am very sorry that I have not paid my fee for six years, but I had no possibility of doing so. Even now the British Government does not give permission for money to be sent abroad. I shall do it as soon as there is a chance.

I am
Yours very truly,
B. K. NIKLEWSKI,
First Lieutenant, Polish Forces

New York, N. Y.,
8 August, 1945

Dear Ross:

This is your first letter from me, but I hope not the last. First, thanks for your letters to men-in-service. The news you send is very heartening and the "Letters from Servicemen" really help to keep the gang together. Great work!

I am at present with the Army's Centralized Technical School No. 1 in Europe. It looks as if I might have settled down for awhile and I would like to renew active membership in The American Ceramic Society (I let my membership drop when I left school for the Army in '43). Can you fix me up?

I would also like to get my subscription to *Ceramic Industry* started again. Can you send me the information necessary or get the subscription started and the bill forwarded?

Sorry to ask all these favors but I'm very anxious to once more get "abreast of the times" in a great industry.

Sincerely,
EARL R. SMITH,
First Lieutenant U. S. Army

★

New York, N. Y.,
13 August, 1945

Dear Ross and Staff:

Just a note to let you know I have moved so that I will get your monthly letters on time. Keep them coming. They're great! Best regards.

Sincerely,
EDWIN L. PHILLIPS,
Corporal, U. S. Army

★

New York, N. Y.,
13 August, 1945

Dear Dr. Purdy:

I received the first of your "Ceramists in the Service" a few weeks ago, and then this week the second one arrived. It is certainly a morale booster to know that you home folks are keeping ceramics on the advance.

Having been away from the ceramic industry now for nearly two years, I have lost out on the activities in the field. However, for the past six months I've been located in the gay city of Paris and during this time I have spent several hours reading whatever limited literature pertaining to ceramics I could get my hands on. Too, I have been out to the Ceramic School and the Sevres Manufacturing Company (the Sevres chinaware). However, both places have been hit by bombs and at present there is very little work going on. Also, while in England, I was located near the Pot District (Hanley, Stokes, Newcastle-under-Lyme, etc.), but here again there was very little activity due to the war. I can't make much of a comment on the ceramic ndustry here in Europe for I've not had much of a chance to see a great deal of it. However, due to the bombings and lack of man power, all industries have suffered a great deal and it will take some time for their wounds to heal.

While I'm a bit slow in doing so, I would like to be granted a membership in The Society for 1945. I feel that this is one of the best ways to keep old contacts and to make new ones in the ceramic field. I'm only sorry that I did not join The Society back in 1941 after I finished my schooling. I would appreciate it very much if you would send me a bill for the dues and I will get a money order off to you at once.

The war news is looking very good, and I think that it is only a matter of hours now before the word of peace will be announced. However, it will be several months before I'll be headed back to the States, so continue to mail my correspondence to my present address.

Sincerely,
ROBERT E. WHITFIELD,
Private First Class, U. S. Army

Iwo Jima,
12 August, 1945

Dear Mr. Ross:

I want to thank you for having your very interesting news letter follow me over the Pacific.

In your letter of June 6, 1945, you spoke of giving information on the latest developments and new fields in the ceramic industry. Before the war I was studying ceramic engineering at Alfred University, and I hope to return to my work as soon as I return to civilian life. Therefore, I would greatly appreciate any information and services you have available.

Thank you very much.

Respectfully yours,
BERNARD SCHWARTZ,
Private First Class, U. S. Army

★

New York, N. Y.,
13 August, 1945

Dear Ross:

You, no doubt, have often heard of the old saying that "all good things come at once." If you have never had that, I can but say that you have certainly missed a rare treat.

Yes, it happened to me this past week. Although the news of the possible surrender of Japan overshadowed everything, the arrival of the *Bulletins*, *Journals*, *Abstracts*, and of the many "Letters to Servicemen" from away back in February until your letter of July 28 was indeed an eventful occasion. I've taken every possible opportunity these past four or five days to read the letters and magazines. I've read everything—from the front cover of *The Journal* to The Society Trustees and Officers for 1945–1946 on the back cover of each, from the front cover of the *Abstracts and Bulletin* to the Metal & Thermit Corporation advertisements on the back cover of each—and many I've read two or three times.

My sincere thanks to you, the Officers of The Society, and to the staff for your tireless efforts in keeping The Society and its work at the very best.

I look forward to seeing you soon. No, I couldn't possibly tell you when that might be. The Army works in "dark and mysterious ways" and I would certainly have to be a crystal-gazer and Chief of Staff to understand it at all.

Most sincerely,
STEWART M. LANG,
Sergeant, U. S. Army

P.S. I am in Fontainebleau, France, the home of the famous forest and Napoleon's play Chateau. America, and especially Pennsylvania, can beat it any day or night!!

★

San Francisco, Calif.,
13 August, 1945

Dear Dr. Purdy:

You may be interested in knowing that I am on the Isle of Kauai in the Hawaiian group and that the reputation of the Chamber of Commerce ranks with that of those eminent gentlemen who sell California sunshine. Both are equally in need of tangible assets. A little sugar cane and a few pineapples are grown on the side, but the legend is worth more than the fact.

Perhaps I shall come across a hunk of Polynesian pottery. If so, it will be yours.

Do you have a list of the names, types, and locations of the ceramic industries of the United States? Is such a list available? I should appreciate this information or advice leading to it.

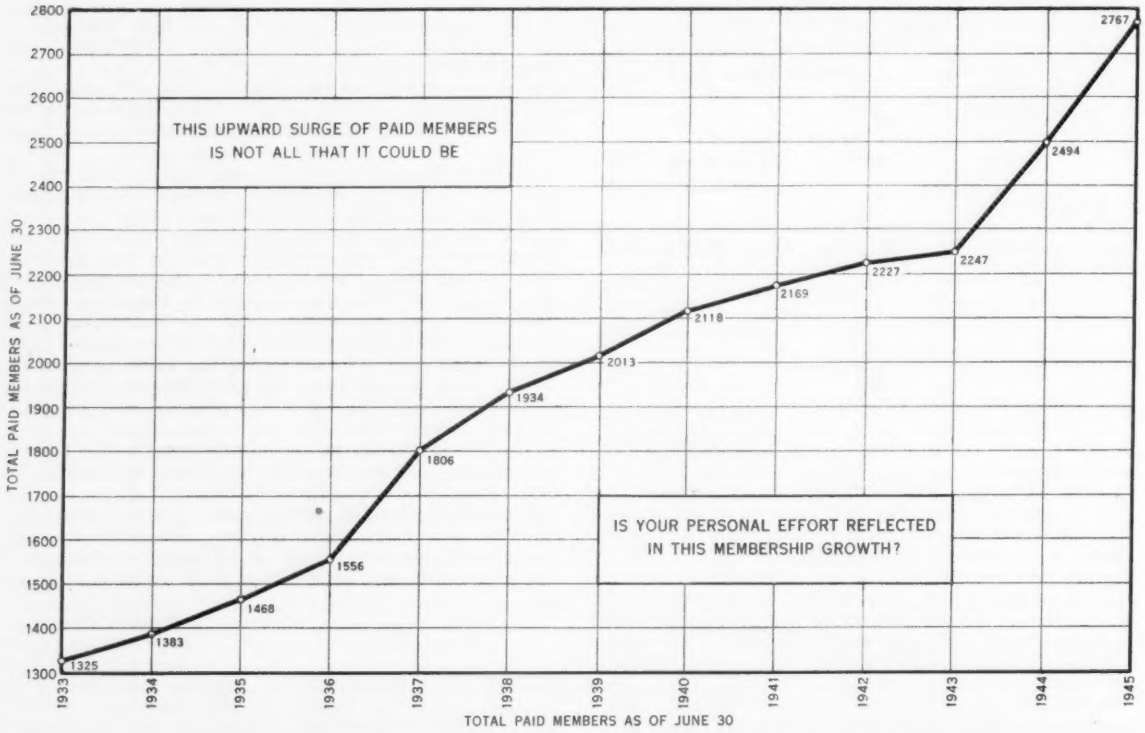
I am anxiously awaiting news of Japan's surrender decision, though this alone will not determine whether I am going to the east or the west.

Yours sincerely,
THOMAS S. SHEVLIN,
Second Lieutenant, U. S. Army

MEMBERSHIP GROWTH

The chart below shows how the membership of The American Ceramic Society has grown in twelve years. It is significant that the rate of growth has increased greatly in the last few years. At this rate, the membership will reach 4500 in 1948 when The Society is fifty years old.

We Can Double the Membership



PAID MEMBERSHIP AND SUBSCRIPTION RECORD

Date of Record	Members Paid		Deferred	Subscriptions	Monthly Sales	Total Circulation
	Personal	Corporation				
August 21, 1944	2198	379	3	604	220	3404
December 21, 1944	2317	402	2	661	220	3602
February 21, 1945	2409	408	2	688	220	3727
March 21, 1945	2103	391	3	647	220	3364
June 21, 1945	2355	411	1	620	220	3607
July 21, 1945	2388	414	3	628	220	3653
August 21, 1945	2416	416	3	643	220	3698
12-month%increase	9.9%	9.8%		6.5%		8.6%

NEW MEMBERS IN AUGUST

Corporation

SOCONY-VACUUM OIL CO., INC., 26 Broadway, New York 4, N. Y.

Personal

BARZAGHI, LUCIANO, 104 Fifteenth Ave., Columbus, Ohio; ceramic chemist, I.P.T., São Paulo, Brazil.

COGEN, SAUL, Davidson Brick Co., 4701 Floral Dr., Los Angeles, Calif. (membership formerly in name of Edward A. Tapper).

HELLMANN, LOUIS E., 212 Fifth Ave., New York 10, N. Y.; president, Castleton China, Inc.

*JOHNSON, PAUL V., National Bureau of Standards, Washington 25, D. C.; physicist.

KIRK, H. C., 117 Greenlee Rd., Pittsburgh 10, Pa.; sales engineer, Mosaic Tile Co.

LINDROTH, STIG A., Erik Dahlbergsgatan 56, Gothenburg, Sweden; assistant, Institute for Research on Glass and Ceramics.

MANNING, JOHN A., 34 Belmont St., Worcester 5, Mass.; Norton Co.

*MEYER, HENRY W., 5323 Lindenwood, St. Louis 9, Mo.; General Steel Castings Corp.

NORRIS, ALAN W., 12A Mayfield Ave., Keele Rd., Newcastle-under-Lyme, Staffordshire, England; research physicist, British Pottery Research Association.

*SHARP, EVERETT W., 827 N. Calhoun, Mexico, Mo.; Mexico Refractories Co.

SMITH, J. R., Kentuckiana Potteries, Inc., Third & Ohio Sts., Paducah, Ky. (membership formerly in name of Richard V. Green).

VAN PEURSEM, RALPH L., 49 Colonial Village Rd., Rochester 10, N. Y.; Rochester Institute of Technology.

Student

New York State College of Ceramics: HENDRIK HEYSTEK.
Princeton University: RICHARD O. WALKER, JR.

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* Indicates former member of The Society rejoining.

MEMBERSHIP WORKERS' RECORD

CORPORATION: Office 1.

PERSONAL: M. H. Berns 1, G. A. Bole 1, Theodore Lenchner 1, Richard H. Martin 1, J. C. Richmond 1, R. Russell, Jr. 1, C. F. Saueriesen 1, W. E. S. Turner 1, Office 4.

STUDENT: J. H. Fuenzalida 1, L. S. O'Bannon 1.

GRAND TOTAL: 15.

ROSTER CHANGES IN AUGUST†

Personal

ADAIR, ROBERT B., 125 Craven St., Beaufort, N. C. (Belmar, N. J.)

BAKER, THEODORE C., 335 E. Indiana St., Perrysburg, Ohio (Newington, Conn.)

BONDAREV, KONSTANTIN J., Bolshaja Semenovskaja Ulitza N. 10, Vsesousnji Institut Stekla, Moscow, U.S.S.R. (New York, N. Y.)

COOPER, WILLIAM G., Engr. Expt. Sta., Ohio State Univ., Columbus 10, Ohio (Baltimore, Md.)

DAVIS, HARRY E., Universal Potteries, Inc., Cambridge, Ohio (East Liverpool, Ohio)

FROMER, CHARLES H., Oak Hill, Ohio (Library, Pa.)

GATES, R. WAYNE, 454 Hornel St., Baltimore 24, Md. (Tuscola, Ill.)

GEIGER, JOSEPH S., 911 Sherman Ave., Apt. 305, Evanston, Ill. (Niagara Falls, N. Y.)

GUTOP, VADIM G., Bolshaja Semenovskaja Ulitza N. 10, Vsesousnji Institut Stekla, Moscow, U.S.S.R. (New York, N. Y.

HESS, ROBERT E., R. T. 3/c, San Francisco, Calif. (Middletown, Ohio)

ILES, RAMON R., 1102 Lenox Ave., Utica, N. Y. (Deansboro, N. Y.)

JEWART, CHARLES N., 88 Grafton Ave., Blasdell Branch, Buffalo, N. Y. (Hamburg, N. Y.)

KASTEN, VERNON L., Three Oaks, Box 84, Jackson, Mo. (Rolla, Mo.)

KEITH, WENDELL P., Norton Co., Worcester 6, Mass. (Cambridge, Mass.)

KOENIG, JOHN H., 1218 N. Troy St., Arlington, Va. (Columbus, Ohio)

KRAMPF, FRANCIS G., Forest View, R.D. 1, Painted Post, N. Y. (Corning, N. Y.)

LING, MENG-CHANG, 709 North 7th St., Allentown, Pa. (Buffalo, N. Y.)

MILLSPAUGH, RAYMOND E., 73 School St., Bradford, Pa. (Corning, N. Y.)

MOONEY, WILLIAM F., 300 Mountain Trail Rd., Sierra Madre, Calif. (Laguna Beach, Calif.)

MORROW, C. T., 303 Tindall Rd., Wilmington 182, Del. (Cape May, N. J.)

POOR, MARY E., Box 378, U. S. Bureau of Mines, Norris, Tenn. (Kansas City, Mo.)

RHODES, GROVER C., 1081 E. Broad St., Columbus, Ohio (Far Hills, N. J.)

RODRIGUEZ, ANTONIO R., Dept. of Chemistry, Room 311, Univ. of Illinois, Urbana, Ill. (Chicago, Ill.)

RUE, CHARLES V., 224 E. Main St., Ligonier, Pa. (Georgetown, Ontario, Canada)

SANDMEYER, KARL H., 58 Seymour St., Tonawanda, N. Y. (Niagara Falls, N. Y.)

SCHWENDLER, RICHARD H., Jackson St., Mentor, Ohio (Cleveland, Ohio)

SHAW, M. C., 289 Seaman St., New Brunswick, N. J. (Metuchen, N. J.)

SWEITZER, MARK, Texas Pottery Works, Box 232, Pasadena, Texas (Scio, Ohio)

SWEO, BENJAMIN J., 17502 Riverway Dr., Lakewood 7, Ohio (Cleveland, Ohio)

SWICKER, VICTOR C., Hartford-Empire Co., Hartford, Conn. (Santa Ana, Calif.)

THORSON, MARION S., 6249 S. Kenwood, Chicago, Ill. (Winnetka, Ill.)

TRABERT, LOREN A., Pickard, Inc., Antioch, Ill. (Fostoria, Ohio)

TURNER, CECIL H., 2552 East 96th St., Chicago, Ill. (Charleston, W. Va.)

UPTON, LEE O., 2544 East 97th Place, Chicago 17, Ill. (Johnstown, Pa.)

WALLACE, WILLIAM W., Box 628, Redlands, Calif. (New Castle, Pa.)

WEAVER, B. DOUGLAS, Nepheline Products, Ltd., Box 430, Lakefield, Ontario, Canada (St. George, S. C.)

WESSELS, VINCENT E., Petoskey Portland Cement Co., Petoskey, Mich. (St. Louis, Mo.)

WHITTINGTON, LLOYD R., 844 Valdes Ave., Akron, Ohio (Barberton, Ohio)

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† Address in parentheses is former address.

CHICAGO DISTRICT ENAMELERS CLUB

The Chicago District Enamelers Club has been accepted for membership in the Chicago Technical Societies Council, Chicago, Ill. President W. W. Higgins has appointed W. J. Plankenhorn as a delegate and George Tuttle as an alternate to attend Council meetings. A second delegate and alternate will be appointed or elected at the time of the next regular Club meeting.

The following have been appointed as committee chairmen for the Chicago District Enamelers Club: Program Committee, C. M. Andrews; Publicity Committee, R. L. Cook; and Membership Committee, E. P. Bolin.

—DANA CHASE, *Secretary-Treasurer*

OHIO CERAMIC INDUSTRIES ASSOCIATION

Ellis Lovejoy and Arthur A. Wells

ELLIS LOVEJOY HONORED

The Ohio Ceramic Industries Association has made Ellis Lovejoy an Honorary Life Member. President Arthur A. Wells presented Mr. Lovejoy with an engrossed certificate at a small ceremony held at his home in Columbus, Ohio, August 17, 1945. Mr. Wells in addressing Mr. Lovejoy said that this class of membership in O.C.I.A. had been especially created to honor him for his part in the advancement of ceramic science and in the founding of modern ceramic research.

In responding, Mr. Lovejoy said that he appreciated the thoughtfulness of his many friends in the Ohio Ceramic Industries Association. Although he had started out to be a mining engineer, he never regretted his change to ceramics and now, when time is being reckoned in half-century intervals, the friendships of those in the ceramic industry are his most valuable possessions.

The legend on the certificate read: "The Ohio Ceramic Industries Association presents to Ellis Lovejoy, in grateful recognition of his outstanding contributions as a pioneer in the advancement of Ceramics from an Art to a Science and his faithful support of the Association throughout the years, this certificate of Honorary Life Membership in the O.C.I.A. Given at Columbus on the seventeenth day of August, nineteen hundred and forty-five. Arthur A. Wells, President; H. E. Nold, Secretary."

The committee which made the presentation consisted of Arthur A. Wells, President; George A. Bole; John L. Carruthers; Frank R. Henry; C. Forrest Tefft; and Harry E. Nold, Secretary. Charles S. Pearce represented The American Ceramic Society.

Ellis Lovejoy also has been actively identified with the development and growth of The American Ceramic Society. A review of his Society activities and an extensive biographical sketch were published in the June, 1937, *Bulletin*, pp. 261–62.

(Reading from left to right): Charles S. Pearce, Harry E. Nold, George A. Bole, Ellis Lovejoy, Frank R. Henry, Arthur A. Wells, John L. Carruthers, C. Forrest Tefft.

PERSONAL NOTES

LAWRENCE E. BARRINGER RETIRES

Lawrence E. Barringer, engineer in charge of the Insulation Engineering Division of the General Electric Co., Schenectady, N. Y., retired June 30, 1945, after being associated with this Company for more than forty-three years.

Dr. Barringer is considered to be an international authority on insulations and porcelain compositions. He has been granted twenty-five United States patents, covering developments in this work, and is the author of more than twenty-eight scientific articles. The Panama-Pacific Exposition Medal was awarded to him in 1915 for his exhibit on insulation, and in 1940 he was given the Lamme Medal by The Ohio State University, Columbus, Ohio, for meritorious achievement in engineering.

Lawrence E. Barringer

A native of Washington, D. C., Dr. Barringer was graduated from Ohio State University in 1902 with the degree of Mining Engineering in Ceramics. In 1933, the same University gave him the Professional Ceramic Engineer's degree, and he was awarded the Honorary Degree of Doctor of Science by Alfred University, Alfred, N. Y., in 1941.

Dr. Barringer has been a member of The American Ceramic Society since 1905 and served as President in 1916. He is a Fellow of The Society and a member of the Institute of Ceramic Engineers. In 1939, he presented the Edward Orton, Jr., Fellow Lecture at the Forty-First Annual Meeting of The Society in Chicago, Ill.

Dr. and Mrs. Barringer plan to divide their time between Sachem Knoll, their summer home at Nantucket, Mass., and their home in Schenectady, N. Y., at 23 Front St.

Upon returning to Schenectady in October, Dr. Barringer expects to take up several special projects in which he is interested, including the writing of articles upon ceramic subjects.

The work of the Insulation Engineering Division, which had been under Dr. Barringer's direction since 1908, has been taken over by the Works Laboratories, the Research Laboratory, the Chemical Department, and the Standards Division.

For a more extensive biographical sketch of Dr. Barringer, see Bull. Amer. Ceram. Soc., **18** [4] 114 (1939).

R. BARTA, SECRETARY, CZECHOSLOVAK CERAMIC SOCIETY, IS SAFE

I beg to inform you that the Czechoslovak Ceramic Society is starting again its activity in the delivered Czechoslovakia and that the Society appreciates deservedly the magnanimous assistance and support rendered our country by the U.S.A. Owing to this help, we can again devote ourselves entirely and freely to our work, after six years of the Naziistic reign of terror and horror. I hope that the traditional friendly relations of our Ceramic Societies will be renewed again and that these relations will lead to the promotion and advantage of the ceramic industry of both our states.

I have been entrusted again with the function of the General Honorary Secretary of our Society. Because of this I happily endured the imprisonment in the concentration camps of Oświęcim, Auschwitz. I prepared to take care of the professional chair for ceramic and glazier's work at the Technical University in Prague.

I am working in the ceramic industry, too. I am glad to get your friendly news. We reckon on your cooperation. And particularly we shall be obliged to you if you will send us all your publications which you brought out since the year 1939. We cannot send you any publications of ours because our activity was very limited and developed under cover.

We nevertheless published articles pertaining to our special branch in the technical press, of which I have the customary abstracts. I beg you to inform me if you will take an interest in these abstracts and if you want to publish them as you did before the war. In this case, I will send them to you at the first opportunity. I look forward with great pleasure to your news and remain

Yours faithfully,

R. BARTA, *Prof. Dr. Eng.*,
General Honorary Secretary of the
Czechoslovak Ceramic Society,
Prague II, 1558

CAPTAIN L. M. MERRITT ON LEAVE

Captain Lester M. Merritt, on the staff of the command service for the Pacific, has returned to active duty after a twenty-day leave at his home in Columbus, Ohio. He came to the United States primarily to take part in a military conference in Washington, D. C.

Captain Merritt has been on active Navy service for four years. Before that, he was active in the Naval Reserve. His son, Croft, Seaman First Class, has been on Caribbean duty with a subchaser.

Before entering active service, Captain Merritt was associated with the Division of Safety and Hygiene of the Industrial Commission of Ohio. He is a member of The American Ceramic Society and the Institute of Ceramic Engineers.

C. C. BLAIR NAMED PRESIDENT OF PAVING BRICK INSTITUTE

Claude C. Blair of the Metropolitan Paving Brick Co., Canton, Ohio, has been named president of the Paving Brick Institute.

The Institute, a national association of manufacturers of paving brick with offices at 1756 K St., Washington 6, D. C., is completing plans for an extensive research program at a leading midwestern university. The program is designed to study the latest technological developments in the manufacture and use of paving brick.

A recent survey of paving-brick manufacturers indicates that except for a temporary shortage of plant workers the industry is prepared to meet heavy postwar demands for its product on short notice, inasmuch as there are no reconversion or retooling problems to be solved.

Standard sizes of paving brick which were adopted before the war will again be available for postwar use.

Mr. Blair has been a member of The American Ceramic Society since 1938.

A. S. CRANDON HEADS AMERICAN WINDOW GLASS COMPANY

Albert S. Crandon has been elected president of the American Window Glass Co., Pittsburgh, Pa., to succeed William L. Monro, who died July 27, 1945 (see p. 353, this issue).

Mr. Crandon has been Corporation representative in The American Ceramic Society for the American Window Glass Company since 1942.

H. E. DAVIS WITH UNIVERSAL POTTERIES

Harry E. Davis has resigned as general superintendent at the plant of Continental Kilns, Inc., Chester, W. Va., to become ceramic engineer for Universal Potteries, Inc., Cambridge, Ohio.

Before his association with Continental Kilns, Mr. Davis was for many years with the Federal Seaboard Terra Cotta Corp., Woodbridge, N. J.

He is a Fellow of The American Ceramic Society and a member of the Institute of Ceramic Engineers.

LIEUTENANT G. C. MUNROE MISSING IN ACTION

Word has been received that Lieutenant George C. Munroe has been missing in action over Germany since April 8, 1945. He was a navigator on a B-17 with the Eighth Air Force.

Before entering the service, Lieutenant Munroe attended The Pennsylvania State College, State College, Pa. He was a Student Member of The American Ceramic Society.

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The American Ceramic Society
FOR CONTINUING EDUCATION
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(*Items marked with star are sold on West Coast only)

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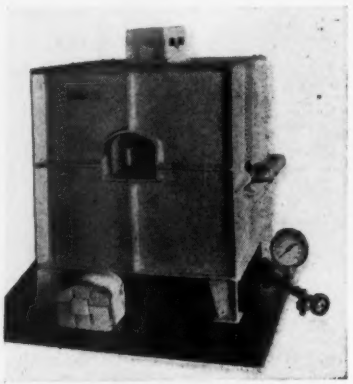

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GILBERT SOLÈR NAMED ASSISTANT GENERAL SUPERINTENDENT OF CANTON PLANT

Gilbert Solèr has been named assistant general superintendent of the Steel & Tube Division, Timken Roller Bearing Co., Canton, Ohio. Before this new assignment, he was superintendent of quality in the Canton plant.

Gilbert Soler

Biography

Gilbert Solèr was born January 4, 1908, in Havana, Cuba. He received his elementary and high-school education in Columbus, Ohio, and attended The Ohio State University, where he received the Bachelor's degree in Ceramic Engineering in 1930, the Master of Science degree in 1931, and the Professional Degree in Metallurgical Engineering in 1940.

While doing his graduate work during 1930–1931, Mr. Solèr worked as research fellow at the University Engineering Experiment Station. After receiving his Master's degree in June, 1931, he became associated as research engineer with the Republic Research Corp., Massillon, Ohio. He left there six months later to accept the position of refractories engineer with the Timken Steel & Tube Co., Canton, Ohio (changed to Steel & Tube Division, Timken Roller Bearing Company, in 1937). He held this post until July, 1934, when he became manager of research. He became manager of the Research and Mill Metallurgical Departments in January, 1937. In May, 1943, he was given the title of superintendent of quality with supervision over the quality control departments of the steel plant, including mill metallurgy, inspection, finished bar and tube conditioning, research, combustion, and refractories.

Activities

Mr. Solèr has been a member of The American Ceramic Society since 1931. He has been active in the Refractories Division, having served in the following capacities: member, Data Committee (1936–1937) and Program Committee (1937–1938); chairman, Program Committee (1938–1939); Secretary of the Division (1939–1940); Vice-Chairman (1940–1941); and Chairman (1941–1942).

He is a Fellow of The Society and a member of the Institute of Ceramic Engineers. At the present time, he is serving as The American Ceramic Society representative on Committee A-1 on Steel, the American Society for Testing Materials. He is a registered professional engineer in ceramics and metallurgy in the State of Ohio.

Mr. Solèr is also a member of the American Institute of Mining and Metallurgical Engineers (vice-chairman, Iron and Steel Division Executive Committee), the American Society for Metals, Keramos, Sigma Xi, Tau Beta Pi, and Sigma Gamma Epsilon.

He has been active as a member of three committees of the National Defense Research Council during World War II.

Publications

(1) (With R. M. King) "Checkerbrick Investigation," *Blast Furnace & Steel Plant*, **19** [5] 724–26 (1931).

(2) (With R. M. King) "Study of Heating and Cooling Rates of Checkerbrick," *Jour. Amer. Ceram. Soc.*, **15** [10] 545–49 (1932).

(3) (With E. E. Callinan) "Insulation of Open Hearth Reduces Time of Heats," *Steel*, **96** [April 15] 62–66 (1935).

(4) "Insulation of Open-Hearth Furnaces," *Blast Furnace & Steel Plant*, **23** [11] 799–800 (1935).

(5) "Refractory Problems in Basic Alloy Steel Production," *Bull. Amer. Ceram. Soc.*, **14** [12] 383–88 (1935).

(6) "Factors to Be Considered in Insulation of Open-Hearth Furnaces," *Iron & Steel Engr.*, **13**, 11–13 (Feb., 1936).

(7) "New Carbometer Control Speeds Production and Improves Quality, " *Metal Progress*, **31**, 159–62 (Feb., 1937).

(8) (With W. A. Hare) "Study of Deoxidizing-Type Inclusions in Alloy Steels," *Trans. Amer. Soc. Metals*, June, 1937.

(9) (With W. A. Hare) "Method of Studying Inclusions in Alloy Steels," *Metals & Alloys*, **8** [6] 169–72 (1937).

(10) (With E. E. Callinan) "Practical Service Testing of Refractories for Alloy Steel Melting (IV, Symposium on Refractories Testing)," *Bull. Amer. Ceram. Soc.*, **16** [8] 329–34 (1937).

(11) (With W. A. Hare and L. Peterson) "Method for Determining Gas Content of Molten Steel," *Trans. Amer. Soc. Metals*, **25**, 889–903 (Sept., 1937).

(12) (With W. A. Hare) "Study of Iron Oxide and Gas Content of Molten Alloy Steel," *ibid.*, Dec., 1937.

(13) (With E. C. Hite) "Refractories for Electric Furnaces, I–II," *Brick & Clay Record*, **94** [6] 48–54; **95** [1] 52–54 (1939).

(14) (With E. C. Hite) "Refractories for Open Hearths, I–III," *ibid.*, **95** [2] 54–57; [3] 59–60; [4] 54–55 (1939).

(15) (With E. C. Hite) "Pouring-Pit Refractories, I–II," *ibid.*, [5] 54–56; [6] 52–55.

(16) (With E. C. Hite) "Soaking-Pit Refractories, I–II," *ibid.*, **96** [1] 62–63; [2] 60–62 (1940).

(17) (With E. C. Hite) "Heating-Furnace Refractories, I–II," *ibid.*, [3] 57–58; [6] 51–52, 62.

(18) (With E. E. Callinan) "Observations on Heating of Steels from Metallurgical Viewpoint," *Iron & Steel Engr.*, **17** [6] 48–57 (1940).

(19) "Influence of Chemical Composition on Hot-Working Properties and Surface Characteristics of Killed Steel," *Amer. Inst. Mining Met. Engrs.*, **145**, 194–212 (1941).

(20) "Hot Tops," *Proc. Nat. Open Hearth Conf. Amer. Inst. Mining Met. Engrs.*, **26**, 64–66 (1943).

(21) (With G. Barrow) "Hardenability Control of a 1 Per Cent Carbon Steel," *Trans. Amer. Soc. Metals*, Dec., 1943.

(22) "Electric Furnace Quality vs. Open Hearth," *Metal Progress*, **46** [3] 480–83 (Sept., 1944).

(23) One of co-authors of the book, Basic Open Hearth Steelmaking, by the Physical Chemistry of Steelmaking Committee, American Institute of Mining and Metallurgical Engineers, 1944.

Patents

(1) (With W. A. Hare and L. D. Peterson) "Collecting Gases from Metals," U. S. 2,143,982, Jan. 17, 1939.

(2) "Free Machining Steel," U. S. 2,225,511, Dec. 17, 1940.

FIRE CLAY IN 1944

The consumption of fire clay declined 19% in 1944, according to the Mineral Market Report issued by the U.S. Bureau of Mines. Even with this decline, more than six million tons of fire clay were used.

ARMY-NAVY "E" AWARDED TO VOLLRATH COMPANY

With impressive ceremony, the coveted Army-Navy "E" was awarded to The Vollrath Co., Sheboygan, Wis., June 29, 1945.

Presiding at the ceremonies was Jean C. Vollrath, president of The Vollrath Company. Major Carl W. Goerling presented the award, and Lt. Comdr. A. T. Samuelson, USNR, presented the Army-Navy "E" pins to the employees.

The Company has been producing enameled ware for the armed forces.

HAYWARD OPTICAL GLASS COMPANY AWARDED ARMY-NAVY "E"

The Hayward Optical Glass Co., Maywood, Calif., was awarded the Army-Navy "E" May 29, 1945. The Award was presented by B. M. Burchfiel, Commander, USNR.

The Company, peacetime producer of glass containers, was awarded this production honor for excellence in the manufacture of finest-quality optical glass.

W. L. Hoeppner is manager of the Company.

Both Commander Burchfiel and Mr. Hoeppner are members of The American Ceramic Society.

Vollrath Company Army-Navy "E"

LIEUTENANT CLARENCE A. LAMBELET CITED FOR BRAVERY

Word has been received that First Lieutenant Clarence A. Lambelet, aged 22, won citations and the Bronze Star Medal for bravery at the Rohr River crossing in Germany February 23–24, 1945.

Lieutenant Lambelet has served with the 992d Engineering Treadway Bridge Company as Company executive officer since D-Day and at the front of the First Army columns helped build bridges through France, Belgium, and Holland. Later his Company was attached to the Ninth Army and built the bridges ahead of it through Germany. He also helped build the Truman Bridge over the Elbe River.

Lieutenant Lambelet is a graduate of the Missouri School of Mines and Metallurgy, Rolla, Mo. (B.S. in ceramic engineering, January, 1943) and is a Student Member of The American Ceramic Society.

PORCELANITE FOR FURNACE PATCHING

Porcelanite, a corrosion-resisting porcelainlike finish, has been developed by the O. Hommel Co., Pittsburgh, Pa.

Porcelanite forms a pure-white, semiglazed finish over brick and clay, sealing up all crevices. The corrosive action of gases, flue dust, slag, etc., is materially reduced and the furnace retains its heat. Discoloration of molten-glass chinaware and porcelain enamels, by the iron oxide present in all firebrick, is absolutely prevented. It resists a furnace heat of 3000°.

The refractory chemical comes as a white powder, which is mixed with water and applied like paint. In new construction, the brick are dipped in the usual manner before laying. Porcelanite can be sprayed on the wall surface or applied with a brush.

Porcelanite air-sets and the oven can be fired immediately.

It is adaptable for use with saggers, lehrs, muffles, ladle linings, decorating kilns, and iron and glass furnaces.

BRICKLAYING TODAY

Intense interest has developed in an argument which is going on in England today over the number of brick that a mason should lay in a day. The Ministry of Works has set up a requirement of 720 brick in a nine-hour day on a nine-inch wall. This has been protested as too high, and a request has been made that the expected day's work be set at from 200 to 300 brick.

Sir Harry Selley, Member of Parliament, age 73, contended that this was absurdly small. To prove this contention, he offered to pay a hospital £1 for every brick under 200 that he laid in two hours. May 18 he completed laying 200 brick in a four-course wall in 58 minutes.

This argument serves to recall the work of Frank Gilbreth, the eminent American engineer, who wanted to check the inroads of concrete masonry on his brick-contracting business in Boston in 1910. With accurately planned equipment, organization, and materials he was able to get bricklayers to place 3000 brick a day in foundation work.

He gave the science of motion study to American industry. His work has been carried forward since his death by his wife, Dr. Lillian Gilbreth.

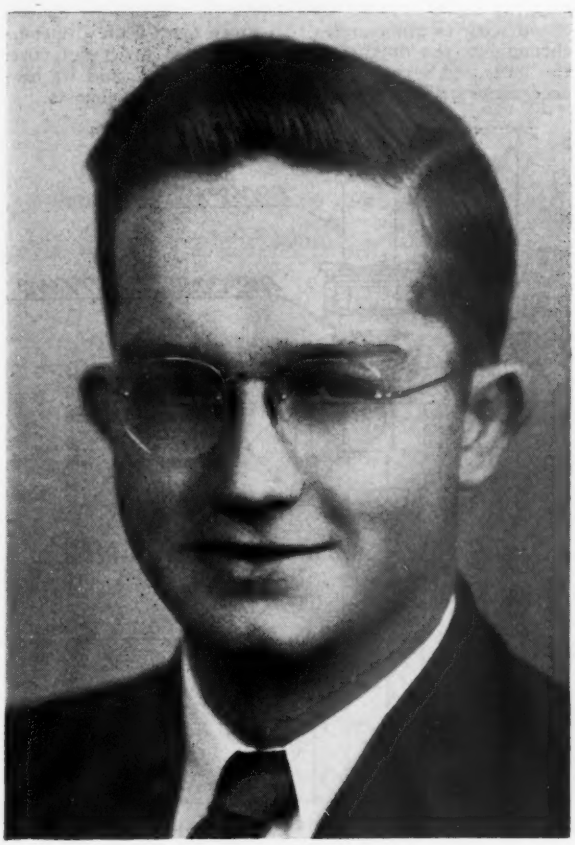
NECROLOGY

SEAMAN F. E. SNYDER, JR.

Previously reported missing, Seaman First Class Frederick Edward Snyder, Jr., 24, has now been listed as killed in action. He was a radar man on the destroyer *Drexler* which was sunk off Okinawa May 28, 1945.

Seaman Snyder, a Student Member of The American Ceramic Society, was graduated from the Philipsburg High School in 1940 and in October, 1943, received the B.S. degree in Ceramics from The Pennsylvania State College, State College, Pa. From the time of his graduation until his induction into the Navy in May, 1944, he was research assistant in the Ceramic Department at The Pennsylvania State College.

He is survived by his parents, Mr. and Mrs. F. E. Snyder, West Decatur, Pa; one brother, Thomas E., of Norristown, Pa.; and a sister, Alice M., at home.



Seaman F. E. Snyder, Jr.

MARIE COFFEY KLINEFELTER

The many friends of Marie C. Klinefelter will learn with deep regret of her death in Tuscaloosa, Ala., July 28, 1945. Burial took place in Columbus, Ohio, July 30.

To her husband, T. A. Klinefelter, and to her three children, John, Senior Lieutenant, U. S. Marine Corps (overseas); James, Midshipman, U. S. Navy; and Nora Ellen, at home, is extended our sympathy.

W. L. MONRO*

William Loftus Monro, president of the American Window Glass Company, active in civic and industrial activities of Pittsburgh for fifty-four years, died July 27 at his Pittsburgh residence. He was seventy-nine years old. He was also a member of the Executive Committee, Westinghouse Airbrake Company, and the Union Switch & Signal Company, and director of the Reliance Life Insurance Company, Farmers Deposit National Bank, Western Pennsylvania Natural Gas Company, Pennsylvania Manufacturers Association Fire Insurance Company, Pennsylvania Manufacturers Association Casualty Insurance Company, and trustee of the Dollar Savings Bank of Pittsburgh.

Born in Pittsburgh, a son of George Nugent Monro of Ascot, Buckinghamshire, England, distinguished lawyer, and the former Sarah Ann Morgan of Louisville, Ky., he received his A.B. degree from Harvard in 1889. After being admitted to the Allegheny County Bar, he began his law practice in his father's office.

One of his first law clients, one of the oldest in the glass industry in Western Pennsylvania, had been engaged in the manufacture of window glass and bottles. Through his personal contact with the company's affairs, Mr. Monro, while still practicing law, became conversant with the intricate details of the window glass manufacturing business. The company was bought out by the American Window Glass Company, which, at the time, controlled about 80% of the window glass production of the United States. Having become very much interested in the industry and its problems and opportunities, Mr. Monro organized the Pittsburgh Window Glass Company and built a factory at Washington, Pa. Practically the entire organization of the old company allied itself with the Pittsburgh Window Glass Company, of which Mr. Monro served as president until 1906. In the meantime, he had been elected (1902) secretary and treasurer of the Federated Window Glass Co., Columbus, Ohio, a corporation which did not manufacture window glass but acted as a sales agency.

In November, 1906, the year of his retirement from law practice, Mr. Monro became general manager of the American Window Glass Company. The company had some time previously installed newly patented cylinder-drawing window glass machines, but had been unable to operate them successfully. Mr. Monro developed the machines for the production of window glass superior to the handblown product. It is a fact of historical interest that this mechanical cylinder process for window glassmaking was the first major change in manufacturing methods in the industry for five hundred years. The improved process, brought about under Mr. Monro's supervision, was quickly adopted under license in England, France, Germany, Italy, Spain, Portugal, Austro-Hungary, Russia, and Japan.

In 1919, he was elected president and director of the American Window Glass Company, and filled the same executive capacity with The American Photo Glass & Export Co., the Western Pennsylvania Natural Gas Company, the American Window Glass Machine Company, The Window Glass Machine Company, and the Empire Machine Company. It was at this time that the American Window Glass Company installed at their Jeannette plant the largest glassmelting tank ever built. Glass was drawn up to 30 inches in diameter and in lengths up to 520 inches. Under Mr. Monro's direction, the company made gratifying progress with the new process

* From *Nat. Glass Budget*, **61** [14] 3, 13 (August 4, 1945).
For a photograph of Mr. Monro, see *Jour. Amer. Ceram. Soc.*, **6** [1] 253 (1923).

and succeeded then in producing the clearest window glass manufactured in any part of the world. In addition, a type of glass was developed that would transmit a substantial portion of ultraviolet rays in the lower light wave lengths. This variety of glass had distinct therapeutic and prophylactic properties.

During his business career, Mr. Monro had been Director of the Fourteenth Street Bank, the Pittsburgh Chamber of Commerce, Duquesne Light Company, Philadelphia Company, Equitable Gas Company, Pittsburgh Railways Company, Window Glass Manufacturers Association, and Pennsylvania Central Airlines. He was a member of the National Association of Manufacturers and a member of the Board of Corporators of the Allegheny Cemetery Association.

He was the author of "Window Glass in the Making" (1926). He contributed "Pittsburgh and the Glass Industry," a section of Pittsburgh and the Pittsburgh Spirit (1927–1928).

For the past forty years, Mr. Monro was recognized as the outstanding orator and industrial speaker in the glass industry, possessing a fine personality and an intimate knowledge of the international sheet glass industry. He would hold the undivided attention of large assemblies for more than an hour.

He leaves two sons, C. Bedell Monro, president of the Pennsylvania Central Airlines, and George N. Monro, 3d, Lieutenant Senior Grade, United States Navy, recently returned from active duty in the Pacific theatre of war; the eldest son, William Loftus Monro, Jr., died in Pittsburgh in 1942.

NOTES

MODULAR COORDINATION

At a cost of nearly $3000, the Producers' Council and the American Institute of Architects are producing a slide film entitled "A Scotsman Looks at Modular Coordination." This film is developed after material included in a lecture on the subject by Mr. Lorimer.

A new committee has been formed in Northern California to promote the use of modular masonry with C. W. Kraft, Kraftile Co., Niles, Calif., as president.

Metal windows, granite blocks, wood doors, and flue lining are discussed in new publications on modular dimensions.

Kitchen cabinets are under study and if they are successfully treated all other kitchen appliances may come under this development.

KAOLIN PRODUCTION

The Mineral Market Report of the U. S. Bureau of Mines shows that the production of kaolin has been steady for the past five years, although the usage in refractories has declined about 30%. The amount used in pottery has remained at 10% of the total production. The State of Georgia furnished 77% of the total tonnage.

PAVING BRICK DEMAND MARKET

Highway construction, including streets and roads for new postwar subdivisions, is expected to reach record-breaking proportions within eighteen months after the end of the war and should reach the unprecedented total of about 2 billion dollars annually shortly thereafter, according to Claude C. Blair, recently named president of the Paving Brick Institute, Washington, D. C.

The volume of highway construction in the past has never exceeded 1.5 billion dollars in any year, and the average for the 20-year period preceding the war was slightly less than one billion dollars annually, so that the postwar prospects are nearly double the prewar average.

In addition, the 9-billion-dollar estimate for the five postwar years is 38% greater than the record set in the 5-year period 1927–1931.

In addition to thousands of miles of two- and four-lane highways to be built throughout the country in the early years after the war, the one million new dwelling units to be built annually will require many miles of new municipal streets, while an extensive program of secondary roads designed to speed farm produce to market will further increase the road-building program.

Highway construction will get off to an early start when restrictions on civilian construction are removed, inasmuch as manufacturers of paving brick and other needed materials will not be handicapped by lengthy reconversion problems.

NEW SILICA BLOCK FOR RADIAMATICS

A new silica block for the measurement of crown temperatures in glass tanks has been developed for use with Radiamatics, radiation pyrometers made by the Brown Instrument Co., Philadelphia, Pa.

The new silica block has three additional advantages, viz., (1) more constant calibration than is usually experienced with thermocouples, (2) more open scale divisions throughout the operating range, and (3) lower net cost; the increased service life of the Radiamatic and its new accessories will more than offset additional initial costs.

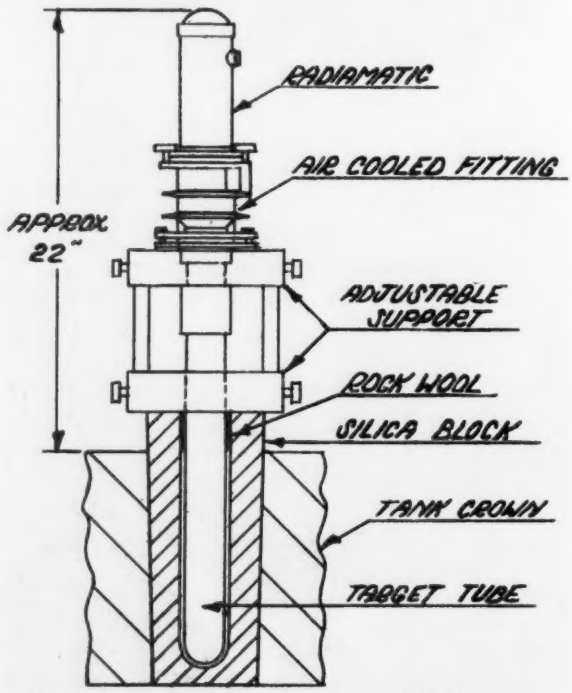


Diagram of new silica block for use with Radiamatics

The single-hole silica block is installed flush with inside roof surfaces. It is sometimes installed so that the bottom of the block extends into the furnace for several inches. The Radiamatic is sighted into an 18-inch sillimanite target tube which is installed in the block to within 1/4 inch of the bottom. An air-cooled fitting only is necessary to prevent overheating of the Radiamatic under normal operating conditions. The target tube is maintained under a slight positive pressure by connecting to a low-pressure air supply.

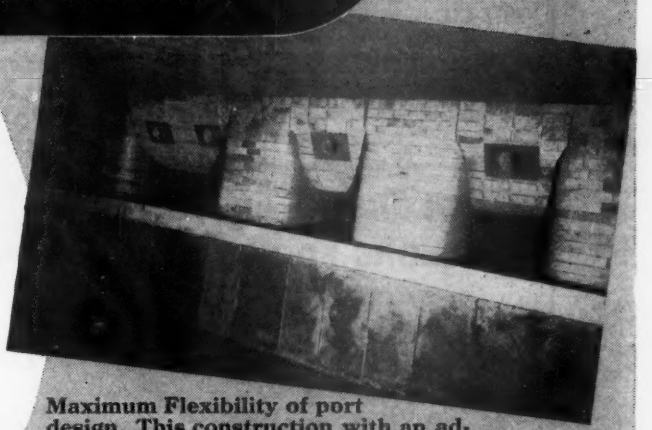
The sillimanite target tube is accurately positioned by adjustment of the vertical support. The annular opening between the sillimanite tube and the silica block is packed with rock wool or similar material to prevent accumulation of batch dust.

Successful Installations of

SIMPLEX EQUIPMENT

Simplex Equipment throughout the glassmaking world is today carrying a production burden that has helped meet the unusual demands on the industry.

This is evidence of Frazier-Simplex engineering ability to successfully design glass plant equipment for you.



Maximum Flexibility of port design. This construction with an adjustable suspended roof over port opening provides directional control over the flame and permits a wider port for maximum dispersion of the oil. The possibility of flame impingement on refractories is reduced to a minimum.

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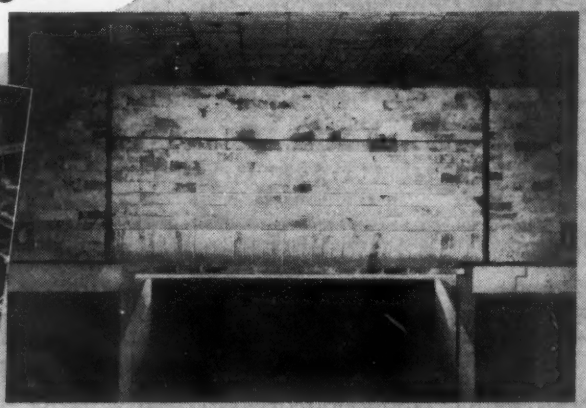

Inside view of tank showing adjustable suspended back wall and "fritting" chamber. The incoming materials stream is uniformly distributed across the "fritting" chamber for faster and more complete dust free melting.

Outside view of wide covered charging bay before batch charger is placed in position showing adjustable water coolers and air cooling manifold. A Simplex Blanket Feeding System means more glass . . . less fuel . . . and improvement in service life of refractories.

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Arches(Interlocking, Suspended, and Circular)
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Arsenic
Drakenfeld, B. F., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Ball Mills
Drakenfeld, B. F., & Co., Inc.
Hommel, O., Co., Inc.
McDanel Refractory Porcelain Co.
Vitro Mfg. Co.

Ball Mills (Laboratory Type)
Barium Reduction Co.
Drakenfeld, B. F., & Co., Inc.
Hommel, O., Co., Inc.
Vitro Mfg. Co.

Barium Carbonate
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc.
Foote Mineral Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Vitro Mfg. Co.

Barytes
Clinchfield Sand & Feldspar Corp.
Harshaw Chemical Co.

Basic Oxides
Drakenfeld, B. F., & Co., Inc.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pemco Corp.

Batch Systems & Chargers
Frazier-Simplex, Inc.

Batts
Carborundum Co. (*"Carbofrax Aloxite"*)
Electro Refractories & Alloys Corp.
Norton Co. (*Alundum-Crystolon*)
Remmey, Richard C., Son Co.

Bentonite
Great Lakes Foundry Sand Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc

Beryl
Foote Mineral Co.

Bichromate of Soda
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Hommel, O., Co., Inc.

Bitstone
Potters Supply Co.

Blocks (Refractory)
Carborundum Co.
Corhart Refractories Co.
Electro Refractories & Alloys Corp.
Norton Co.
Remmey, Richard C., Son Co.
Vitro Mfg. Co.

Blowers
Robinson Ventilating Co.

Body Stains
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Du Pont de Nemours, E. I., & Co., Inc.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Pemco Corp.

Bone Ash
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Harshaw Chemical Co.
Hommel, O., Co., Inc.

Borax
American Potash & Chemical Corp.
Drakenfeld, B. F., & Co., Inc.
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Innis, Speiden & Co.
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Stauffer Chemical Co.
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Du Pont de Nemours, E. I., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pacific Coast Borax Co.
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Vitro Mfg. Co.

Boric Acid (Anhydrous)
Drakenfeld, B. F., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pacific Coast Borax Co.
Stauffer Chemical Co.
Vitro Mfg. Co.

Boric Acid (Crystal, Granular, or Powder)
American Potash & Chemical Corp.
Drakenfeld, B. F., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Innis, Speiden & Co.
Pacific Coast Borax Co.
Stauffer Chemical Co.
Vitro Mfg. Co.

Boron Carbide
Norton Co.

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Lancaster Iron Works, Inc.

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Carborundum Co. (*"Carbofrax Aloxite"*)
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Electro Refractories & Alloys Corp.
Norton Co.
Remmey, Richard C., Son Co.
Vitro Mfg. Co.

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Drakenfeld, B. F., & Co., Inc.

Cadmium Sulphide
Drakenfeld, B. F., & Co., Inc.
Du Pont, de Nemours and Co., Inc., Electrochemicals Dept.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Carbofrax (Refractory Products)
Carborundum Co.

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Du Pont de Nemours, E. I., & Co., Inc.
Foote Mineral Co.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Vitro Mfg. Co.

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Harshaw Chemical Co.
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Solvay Sales Corp.

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Solvay Sales Corp.
Stauffer Chemical Co.
Vitro Mfg. Co.

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Carborundum Co.
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Electro Refractories & Alloys Co.
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Pennsylvania Salt Mfg. Co.
Remmey, Richard C., Son Co.

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Du Pont de Nemours, E. I., & Co., Inc. Electrochemicals Dept.
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Harshaw Chemical Co.
Hommel, O., Co., Inc.
Metal & Thermit Corp.
Pemco Corp.
Pennsylvania Salt Mfg. Co.
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Vitro Mfg. Co.

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Harshaw Chemical Co.
Hommel, O., Co., Inc.

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Hommel, O., Co., Inc.

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Hommel, O., Co., Inc.
Pemco Corp.
Vitro Mfg. Co.

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Hommel, O., Co., Inc.
Maxson, Elwyn L.
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Hommel, O., Co., Inc.
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Metal & Thermit Corp.
Pemco Corp.
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Maxson, Elwyn L.
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Pemco Corp.
Vitro Mfg. Co.

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Hommel, O., Co., Inc.

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Electro Refractories & Alloys Corp.
Norton Co.
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Great Lakes Foundry Sand Co.
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Maxson, Elwyn L.
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Maxson, Elwyn L.
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Hommel, O., Co., Inc.

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Harshaw Chemical Co.
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Frazier-Simplex, Inc.
Harrop Ceramic Service Co.
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Hommel, O., Co., Inc.
Swindell-Dressler Corp.

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Ferro Enamel Corp.—Allied Engineering Div.
Harrop Ceramic Service Co.
Maxson, Elwyn L.
Swindell-Dressler Corp.

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Norton Co.
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Hommel, O., Co., Inc.
Metalloy Corp.

Lithium Flouride
Metalloy Corp.

Lithium Minerals
Foote Mineral Co.
Metalloy Corp.

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Hammill & Gillespie, Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Vitro Mfg Co.

Magnesite Calcined
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Harshaw Chemical Co.
Hommel, O., Co., Inc.

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Drakenfeld, B. F., & Co., Inc.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

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Ferro Enamel Corp.
Foote Mineral Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
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Hommel, O., Co., Inc.

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Hammill & Gillespie, Inc.
Harshaw Chemical Co.
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Orefraction, Inc.
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Corhart Refractories Co.
Remmey, Richard C., Son Co.

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Hommel, O., Co., Inc.
Pennsylvania Salt Mfg. Co.

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Foote Mineral Co.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Nepheline Syenite
Great Lakes Foundry Sand Co.
Maxson, Elwyn L.

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Nitrates (Cobalt, Sodium)
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Vitro Mfg. Co.

Nitre
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Norbide (Norton Boron Carbide)
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Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.

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Titanium Alloy & Mfg. Co.
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